AIRFIELD PAVEMENT EVALUATION

KING SALMON AIRPORT, ALASKA

MARCH 1992

AFCESA

AIR FORCE CIVIL ENGINEERING SUPPORT AGENCY
TYNDALL AIR FORCE BASE
FLORIDA 32403-6001

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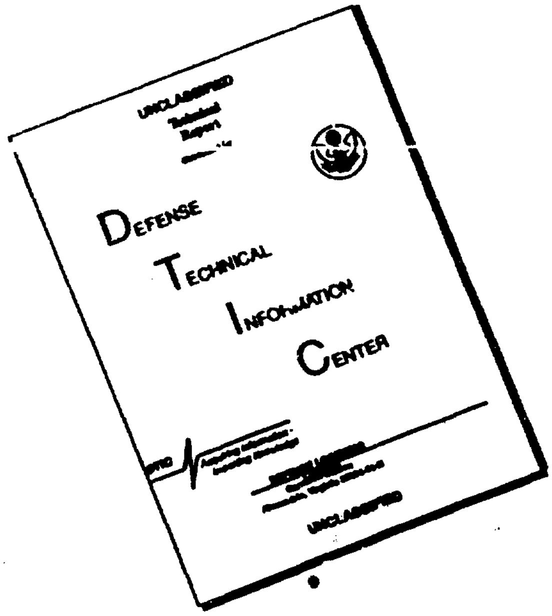

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AIRFIELD PAVEMENT EVALUATION

KING SALMON AIRPORT

ALASKA

PREPARED FOR

PACIFIC AIR FORCES

BY

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EXECUTIVE SUMMARY

A Pavement Evaluation Team from HQ Air Force Civil Engineering Support Agency (HQ AFCESA) conducted a nondestructive, structural pavement evaluation at King Salmon Airport, Alaska, during 7-12 August 1991. The analysis indicated the pavements overall are structurally capable of handling the current level of aircraft traffic. Exceptions are the southeast touchdown area on the Runway, which is only likely to last 5 to 10 years, and the Transient Apron and access taxiways, which are overloaded by moderately to heavily loaded C-141, C-5, and KC-135 aircraft. Taxiway E on the civilian side is also very weak. Additional discussion regarding weak pavement features is provided on pages 14 and 15. The Allowable Gross Load Table contained in Appendix F of this report gives detailed information on allowable aircraft weights for given traffic volumes on each pavement feature. A separate list of AGLs is provided for use during the spring thaw. Most of the airfield pavements are in GOOD to VERY GOOD condition based on surface distresses. The most significant problem is cold temperature cracking of the asphalt pavements throughout the airfield. The cracks are generally well maintained, which is one reason for the high condition ratings of many features. For all asphalt paving projects, it is very important that the proper grade of asphalt cement be specified. Otherwise, premature cracking will occur during winter. Guidance is provided in Section VI of this report on selecting asphalt cement for cold regions. Also, the joints and cracks need to be resealed within one or two years for virtually all of the PCC pavement features, along with spall repairs and an occasional slab replacement in some areas. The northwest touchdown area on Runway 11-29 particularly needs maintenance.

The "Runway PCN" which is to be reported in the FLIP chart is 28/R/B/W/T.

SECTION I: INTRODUCTION

A. Scope

1. A pavement evaluation team from HQ Air Force Civil Engineering Support Agency (AFCESA) conducted a nondestructive structural pavement evaluation at King Salmon Airport, Alaska, during 7-12 August 1991. The primary objectives were to:

a. Determine in-place physical properties of the pavement structure for each feature,

b. Compute allowable gross loadings for those features,

c. Rate the surface condition of each feature, and

d. Identify causes for existing or potential pavement distresses and make subsequent recommendations.

2. This report provides operations and civil engineering functions with airfield pavement strength and condition information that can be used to manage and control an airfield system. Results of pavement evaluation studies can be used to:

a. Determine sizes, types, gear configuration, and gross weights of aircraft that can safely operate from a given airfield feature without damage to the pavements or the aircraft.

b. Develop operations usage patterns for a particular airfield pavement system (for example parking plans, apron usage patterns, traffic flow, etc.).

c. Project or identify major maintenance or repair requirements for an airfield to support present or proposed aircraft missions. When pavement rehabilitations are needed, it can be used to furnish engineering data to aid in the project design.

d. Help air base mission and contingency planning functions through the development of airfield layout and physical property data.

e. Develop and validate pavement system profile information.

f. Support programming documents that justify major pavement restoration projects.

3. Many detailed appendices are used for ease of reporting the vast amount of information gathered. A description of each appendix is provided below:

Appendix	Description
A	Airfield Feature Layout Plan: Graphically depicts different pavement features of the airfield, and indicates the primary pavements.
B	Construction History: Contains an updated construction history for the evaluated features.
C	Field Test/Core Locations and Results: Documents the locations where Falling Weight Deflectometer (FWD) tests were conducted and cores extracted. Core thicknesses are recorded, along with portland cement concrete (PCC) flexural strengths. Dynamic Cone Penetrometer (DCP) results are displayed.
D	Condition Survey: Rates the surface condition of the airfield features. These ratings are a qualitative assessment based upon visual observations. The rating scale is the same as used in AFR 93-5.
E	Summary of Physical Property Data and Lab Testing Results: Physical properties of each pavement feature evaluated are tabulated in this appendix. Included are feature dimensions, material types, thicknesses of layers, and engineering properties.
F	Allowable Gross Loads (AGLs) and Pavement Classification Numbers (PCNs): A listing of the allowable magnitude of loads at four pass intensity levels for each aircraft group is shown. PCNs, a standardized method of reporting pavement strength, are also included.
G	Related Information: Included in this are climatic data, Aircraft Group Indices, Gross Weight Limits for Aircraft Groups, and Pass Intensity Levels.

B. Pavements Evaluated

The airfield pavements evaluated include Runway 11-29 and the aprons and taxiways used by the US Air Force. The east half of the cross runway and Taxiways C and E, which are used by the Air Force when taxiing to and from Taxiway 4, were also evaluated. The East Ramp and the Fish Ramp were not evaluated. Appendix A, sheet A-1, shows which pavements were evaluated.

SECTION II: BACKGROUND DATA

A. <u>GENERAL DESCRIPTION OF AIRFIELD</u>. The airfield layout and respective feature designations are presented in Appendix A, page A-1. Runway, taxiway, and apron names are included on sheet A-1.

The airfield consists of a NW-SE runway (Runway 11-29), 8,500 feet long by 150 feet wide. Both touchdown areas are constructed of PCC, and the interior is asphalt. The southeast end of Runway 11-29 has an overrun, but the northwest end does not. There is also a 5000 foot long by 100 foot wide cross runway which is mainly used by small, privately owned aircraft. That runway has 100 foot wide shoulders. The Air Force facilities are located east of the 11 end of the runway, and include alert hangars, aprons and access taxiways, and a small transient parking apron. West of the runway is a commercial passenger terminal and parking ramp, a fish shipping aerial port, and parking space for private aircraft. The majority of pavements at King Salmon Airport are asphalt.

B. <u>AIRCRAFT TRAFFIC</u>. Records documenting the type and frequency of aircraft traffic at King Salmon Airport were not available to the evaluation team. However, the Airfield Manager and Alaska Department of Transportation estimated the annual traffic. Listed below are estimated full stop landings for all using aircraft except for small general aviation type aircraft. There is a very large seasonal increase in traffic during summer due to tourism and the fishing industry.

Aircraft Type	Estimated Annual Passes
737	1000
F-15	400
C-12	300
C-130/L100	300
DC-6	150
727	50
L-188	50
C-5	10
C-141	8
KC-135	4
747	1

C. <u>CONSTRUCTION HISTORY</u>. A detailed construction history table is presented in Appendix B. An evaluation report published by the Army Corps of Engineers in 1963 (Reference 1) is the source of most of the earliest construction history. Additionally, a search was conducted during this evaluation to

identify airfield construction projects that have occurred since the 1963 report was published. The information obtained was used to prepare the construction history.

D. CLIMATIC DATA. Appendix G provides a detailed summary of climatic conditions, including data on temperatures, precipitation, wind, visibility, and other information. The Design Freezing Index at King Salmon Airport is 3326, so frost needs to be considered in design and evaluation of airfield pavements. The weather during the evaluation was generally overcast and cool, with some light rain.

E. DRAINAGE. The storm drainage system (if any) was not observed during the evaluation. Most of the pavements are drained by surface runoff to shallow swales which lead to natural surface drainages at the airfield perimeter. Shallow puddles were observed near Taxiway 1 (Photo 7 in Appendix D), and other locations, after a rainfall.

SECTION III: TEST PROCEDURES

A. Field Testing

1. Nondestructive testing was accomplished using the Dynatest Falling Weight Deflectometer (FWD). The FWD test involves dropping a weight from a predetermined height and measuring the resulting pavement deflection with electronic sensors. A deflection basin is recorded for each test site. A total of 250 FWD tests were performed at representative locations throughout the airfield. The results of those tests, combined with other field and laboratory test results, aircraft load characteristics, and landing gear configurations, were used to calculate the allowable gross loads for each pavement feature.

2. Field testing included extraction of 60 pavement core samples from features throughout the airfield. All PCC core samples were 6 inches in diameter. The cores were used to verify pavement thickness and construction, as well as to help determine pavement flexural strength. At some test sites, the Dynamic Cone Penetrometer (DCP) was used to test the strength of subgrade layers. The DCP measures penetration resistance of subsurface soils to a depth of about 48 inches. The data obtained was correlated to CBR values and used to identify base course or soil layer thicknesses and strength. DCP results are provided in Appendix C.

B. Laboratory Testing

1. PCC cores were tested for strength by tensile splitting on a Universal Testing Machine (UTM) in accordance with ASTM's "Standard Test Methods." The core tensile strengths were then converted to flexural strengths using an empirical relationship (Reference 5). Flexural strengths are reported on the "Core/DCP Location Plan" in Appendix C and in the "Summary of Physical Property Data" in Appendix E.

2. Field inspection of the asphalt cores revealed no apparent problems with the physical properties of the asphalt, the mix design, or the density. Therefore, no laboratory work was performed on the cores.

3. Soils were classified in the laboratory in accordance with ASTM's "Standard Test Methods," using the Unified Soil Classification System (USCS). Grain size distribution curves are shown in Appendix E for each type of soil obtained from the core holes.

SECTION IV: METHODOLOGY OF ANALYSIS

A. Physical Property Data

The principal parameters used for determining AGLs are pavement type, thickness, flexural strength (for PCC only), and modulus of elasticity (Young's Modulus, or E). These parameters are summarized in Appendix E. The values presented were selected as most representative of the pavement properties for the feature where they were obtained. The material type, thickness, and flexural strength were determined from the core samples as described in Section III. The modulus of elasticity, E, was calculated by computer based on the layered elastic theory. The computer assumes a modulus value for each layer in a modeled pavement system, and calculates pavement deflections for that model. The calculated deflections are compared to the deflections measured by the falling weight deflectometer, and a new set of E values are selected. The program continues until a set of modulus values are selected which result in calculated deflections that closely approximate the measured deflections. Pavement load carrying capacity can then be calculated based on the modeled pavement system. Generally, flexible pavements are modeled as three layer systems while rigid and composite pavements are modeled as two layer systems. The failure criteria for rigid pavements is based on the limiting tensile stress in the concrete. For flexible pavements, failure criteria is based on compressive subgrade strain and limiting tensile strain in the asphaltic concrete.

B. Determination of Allowable Gross Loads (AGLs)

The AGLs were compiled by computer program based on procedures in AFM 88-24, and are listed in Appendix F. AGLs were reduced 25% for those features whose condition rating was POOR or worse. The data contained on the Related Data Sheet in Appendix G is essential to understanding the AGL tables. The AGLs are calculated from the physical properties of the pavement, and the aircraft gear characteristics. In addition, reduced AGLs were calculated for use during the frost melt period in spring based on the reduced subgrade strength that can be expected at that time each year. One AGL Table was prepared for normal conditions and another AGL Table was prepared for use during spring thaw.

A pavement system has a maximum value of stress (in PCC) or strain (in asphalt) which if exceeded, will result in failed pavement. But even if it is only loaded to a level causing, say 75% of the maximum stress or strain, the pavement will

experience fatigue, which will eventually lead to failure. Most loads that cause less than 50% of the limiting stress or strain will not shorten the pavement life. The pavement could theoretically withstand infinite passes without failure. But the closer the loading approaches the upper limit, the fewer the number of passes it will take to cause a fatigue failure. For Feature R1A, the AGL tables show that a C-141 loaded to 242 kips (242,000 pounds) can make 50,000 passes. By then the pavement will likely need a major repair or replacement project. As the aircraft weight goes up, the number of passes until failure goes down. For a 339 kip aircraft weight, the pavement can take only 500 passes, and at weights greater than 339 kips the pavement will take even fewer passes. Overloading the pavement will not necessarily cause an instant failure, but the pavement engineer must be aware that there will be some reduction in pavement life. Most pavements are subjected to many different types of aircraft, at various weights, and each one has its own unique impact on pavement life. When evaluating how much life a pavement feature has left, the engineer must consider all of the aircraft that will use the pavement, and the passes that have occurred since the evaluation was performed. Each AGL is based on the assumption that all of the pavement life is used by that one aircraft type. When several different aircraft use the airfield, each aircraft type uses a portion of the pavement life, and the combined effect on pavement life from all aircraft must be taken into account. An example of how the AGL tables can be used to determine the allowable gross load for any pass level is shown below. In similar fashion, the life of a pavement feature, or number of passes until failure, can be determined for a given aircraft weight.

EXAMPLE PROBLEM

Runway 11-29 will be used for increased C-141 operations. For the weakest runway feature (a) determine the number of passes a 300 kip C-141 can make before pavement failure. (b) What is the maximum load for 8000 passes of a C-141 on that feature?

SOLUTION

From the AGL Table in Appendix F, Feature R9A is the weakest feature on Runway 11-29, and the allowable gross loads for Group 9 aircraft on Feature R9A at Pass Intensity Level I-IV (50,000, 15,000, 3000, and 500 passes) are 218, 243, 285, and 354 kips, respectively. The weights and passes are plotted on semi-log paper as shown in Figure 1. (a) The completed graph indicates the pavement can safely support 2000 passes of a 300 kip C-141. (b) Also using Figure 1, the aircraft weight must

be limited to 260 kips if 8000 passes must be supported over the expected life of the pavement. In this example, it was assumed there are no other aircraft using the pavement. If there were, those other aircraft must be included in the analysis, and the C-141 would need to be limited to even lower numbers of passes and lower allowable weights.

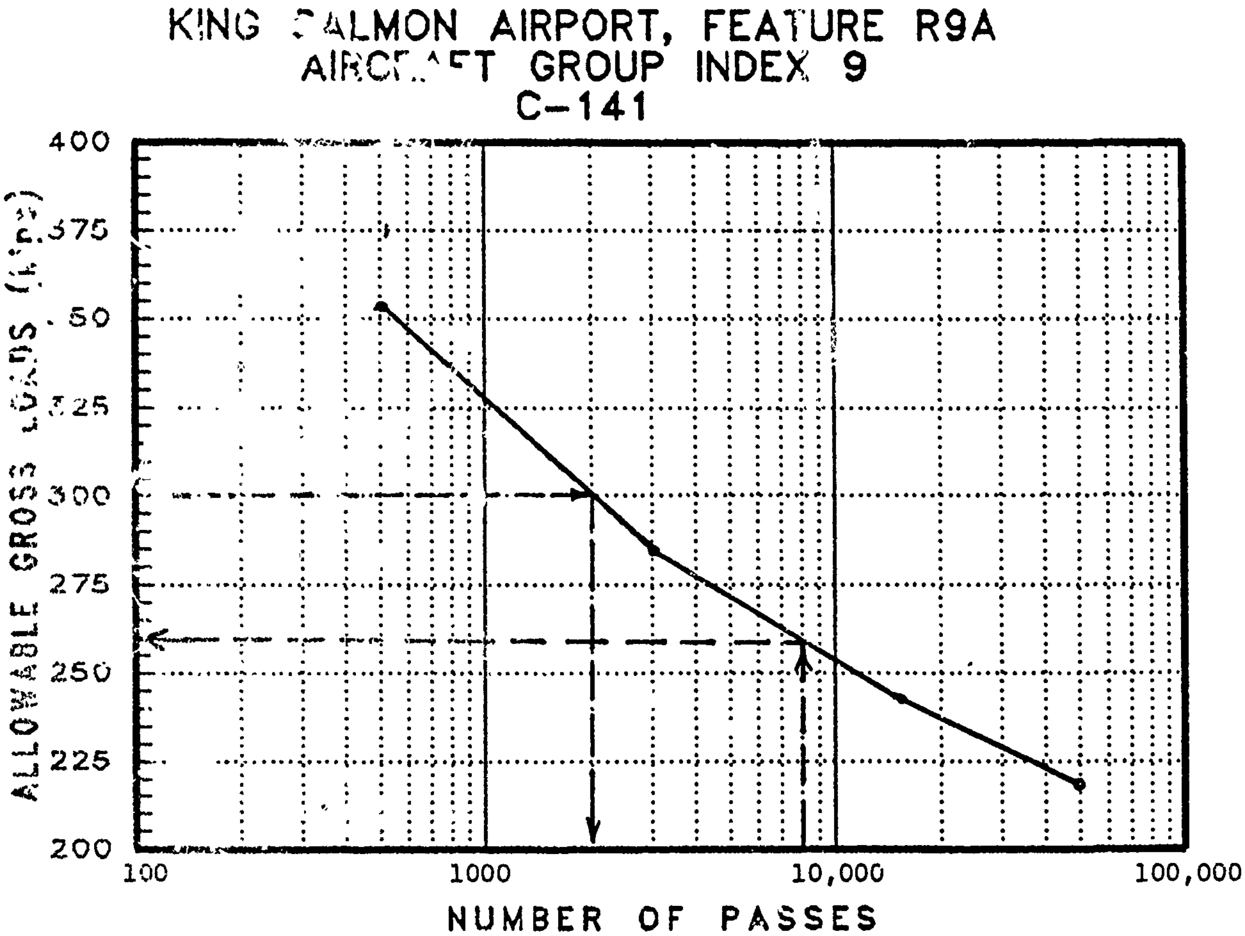

FIGURE 1

C. Pavement Classification Number

The International Civil Aviation Organization (ICAO) has developed and adopted a standardized method of reporting pavement strength. This procedure is known as the Aircraft Classification Number/Pavement Classification Number (ACN/PCN) method (Reference 6). The ACN is a number that expresses the structural effect an aircraft will have on a pavement. ACN values are published in References 6 and 7. The PCN is a number that expresses the capability of a pavement to support aircraft. Appendix F provides PCN values for each pavement feature. The reported PCN values are based on a standard pavement life of 50,000 passes of Group 9 aircraft. The PCN will vary depending on which aircraft group it is based upon; however, the PCNs listed should be sufficient as a guide.

In the ACN/PCN method, the PCN, pavement type, subgrade strength category, tire pressure category, and evaluation method are all reported together. A code system has been implemented to allow an abbreviated presentation of the necessary information. The pavement type is abbreviated "R" for rigid (PCC), and "F" for flexible (asphalt) pavements. There are four subgrade categories: A, B, C, and D, for high, medium, low, and ultralow subgrade strengths respectively. The four tire pressures categories are W, X, Y, and Z, for high, medium, low, and very low tire pressures. The evaluation methods are technical, "T", or "U", which is based on the type aircraft that commonly use the airfield. The PCN number 31/R/C/W/T, for example, indicates a PCN of 31, a rigid pavement, a low strength subgrade, high pressure tires are allowed, and a technical evaluation was performed to determine the PCN. Each part of the code is important. The number "31" cannot be used properly without the letters that follow.

An ACN can be obtained from References 6 or 7 for any combination of pavement type, subgrade category, and aircraft weight. For a 345,000 pound C-141, the eight possible ACN values are listed below:

RIGID PAVEMENT	FLEXIBLE PAVEMENT
50/R/A	51/F/A
60/R/B	58/F/B
68/R/C	70/F/C
75/R/D	82/F/D

It is very important to be aware that the ACN number varies depending on pavement type and subgrade strength category. As shown above, for a 345,000 pound C-141, the ACN for rigid pavements varies from 50 for a high strength subgrade, to 75 for an ultralow strength subgrade. For a C-141 at the same

weight on a flexible pavement, the ACN ranges from 51 to 82 depending on the subgrade category. For lower aircraft weights, the ACNs are lower. When analyzing the effect of an aircraft on a specific pavement feature, the appropriate ACN must be selected. For example, from Appendix F, the PCN for Feature R1A is 46/R/B/W/T. To determine the effect of a 345,000 pound C-141 on Feature R1A, the correct ACN is 60/R/B. More details on the PCN nomenclature are provided in Appendix F and in the examples below.

A pavement will support operations of an aircraft if the PCN is equal to or greater than the ACN. If the PCN is less than the ACN, the pavement will be overloaded. There may be situations when operators decide it is acceptable to overload a pavement. Pavements can usually support some overload, however, pavement life is reduced. Appendix F contains four charts that will assist the airfield manager or pavements engineer in determining how much pavement life will be reduced by overloading the pavement. An example of how these charts are used is shown below.

EXAMPLE PROBLEM

A contingency plan calls for 500 passes of a 300 kip KC-135 on Runway 11-29. a) How much of the pavement life will be utilized for the weakest feature? b) How much of the pavement life would be utilized for 500 passes of a 300 kip KC-135 on Feature T3A?

SOLUTION

(a) From Appendix F, Feature R9A has the lowest PCN of the features on Runway 11-29. The PCN is 28/R/B/W/T. The full PCN code also indicates Feature R9A is a rigid pavement over a medium strength subgrade. The ACN of a 300 kip KC-135 on a rigid pavement of medium strength subgrade is 44, from Reference 6 or 7. Therefore, the ACN/PCN ratio is 1.6. Using Chart #1 in Appendix F, 40 percent of the pavement life is utilized for 500 passes of an ACN/PCN ratio of 1.6.
(b) Feature T3A has a PCN of 25/F/B/W/T. It is a flexible pavement on a medium strength subgrade, and the ACN for this case is 44. The ACN/PCN ratio is 1.76, and from Chart #2, 30 percent of the pavement life would be utilized.

Charts #3 and #4 are also for overloading, but in a different format based on finding the number of passes to failure for any given operating weight, using the ACN/PCN ratio again. As an example of how to use Chart #3, assume the same case as part (a) of the problem above. From Chart #3, for an ACN/PCN ratio of 1.6, a 300 kip KC-135 can make about 1250 passes before the pavement would be expected to fail.

SECTION V: PAVEMENT ASSESSMENT

A. Overall Visual Assessment

A visual survey was conducted on all airfield pavements to rate the surface condition for each feature. The survey was not as detailed as the procedure outlined in AFR 93-5, however, the same condition ratings were used. Appendix D-1, Condition Survey, shows the condition rating for each feature on an airfield map. Appendix E also lists these ratings in tabular form. Pavement condition ratings range from EXCELLENT (like new) to FAILED (unsafe for aircraft operations). They are a qualitative assessment of the pavement surface and should not be confused with the structural capacity of a pavement. For example, a relatively thin pavement may be structurally inadequate for heavier aircraft even if the PCI rating is EXCELLENT. On the other hand, a pavement that is strong enough to support any aircraft may still receive a low PCI rating due to surface defects such as FOD potential, spalling joints, or roughness. Identifying the type and severity of distresses can help provide an understanding of the pavement's response to current loads and for projecting its ability to handle future loads.

Airfield pavements at King Salmon Airport are mostly in GOOD to VERY GOOD condition, but there are some pavement features in POOR or FAIR condition. The most common distresses in the asphalt pavements are longitudinal and transverse cracks which are the result of the extremely cold winters for the most part, along with occasional overloading by heavy aircraft. The photos referenced below are shown in Appendix D.

1. Runways

Runway 11-29 has PCC touchdown areas at each end. The 11 end is in FAIR condition, with longitudinal cracks, spalling joints, a few shattered slabs, and joint sealant in poor condition (Photos 8 and 10). Most of the cracks have been sealed and the distresses are low severity, but there are several cases of high severity spalling and medium severity cracks. The cement paste on the surface of some slabs has eroded away, exposing the coarse aggregate (Photo 9).

The PCC touchdown area on the 29 end is in VERY GOOD condition. There are longitudinal cracks through some of the slabs, and two or three of the slabs are shattered. Most of the cracks have been sealed, and the sealant is in moderate condition (Photo 13).

The runway interior is asphalt. The northeast half is in VERY GOOD condition, with longitudinal and transverse cracks. A

small area with raveled asphalt was observed about 1300 feet from the 11 end (Photo 11). The other half of the runway is in GOOD condition, with block cracking (Photo 12). Most of the asphalt cracks were sealed recently, which is one reason the condition rating is as good as it is.

Runway 18-36 is a short runway used mostly by small civilian aircraft and occasionally used by the Air Force to taxi aircraft to Taxiway 4 and the Transient Apron. It is in EXCELLENT condition, with very few distresses of any kind.

There is an asphalt blast pad on the 11 end of Runway 11-29, but no overrun. The pad is in FAIR condition, with longitudinal and transverse cracks. The overrun at the 29 end is in POOR condition. The predominant distresses are block cracking and weathering. The northern 250 feet of Runway 18-36 was not reconstructed when the rest of the runway was. The old sand asphalt pavement was left in place to serve as an overrun. It is in POOR condition and has severe block and alligator cracking (Photo 1). Aircraft must taxi across this overrun in order to reach Taxiway 4. Jet aircraft should not use this route because of the FOD hazard.

2. <u>Taxiways</u>

Taxiway 1 is in GOOD condition, with longitudinal and transverse cracks, and numerous voids in the surface where aggregate is missing (Photo 6). The cracks are well sealed. There is a large bird bath at the low spot of this taxiway near its junction with Taxiway 3 (Photo 7).

Taxiways 2 and 3 are in VERY GOOD condition. The pavement has the same distresses as Taxiway 1, except the longitudinal and transverse cracks are more widely spaced.

Taxiway 4 is in FAIR condition. The predominant distresses are low to medium severity block cracking, the beginning of alligator cracking, and slight rutting (Photo 2). Most of the cracks have been sealed, but the sealant is deteriorated or nonexistent in some areas. A utility patch crossing the taxiway near the Transient Apron is rutted and badly cracked, and needs to be repaired soon (Photo 3).

Taxiway C is in VERY GOOD condition, with widely spaced longitudinal and transverse cracks. The cracks have not been sealed, and a few are medium severity.

Taxiway [illegible] is in POOR condition. Distresses include longitudinal and transverse cracks ranging from low to high severity, weathering, alligator cracks near centerline, and vegetation growing in some of the cracks (Photos 15 and 16).

3. Aprons

The front and rear Alert Aprons are in VERY GOOD condition. There is a small amount of spalling along the joints, and about 10 to 20 percent of the slabs have low severity longitudinal cracks. The sealant is in moderate condition.

The new extension to the rear of the Alert Apron is in EXCELLENT condition for the PCC portion, and VERY GOOD condition for the asphalt portion. The asphalt portion has a few longitudinal cracks that have not been sealed (Photo 5).

The asphalt portion of the Transient Apron is in FAIR condition, with longitudinal and transverse cracks of low to medium severity, and weathering (Photo 4). The PCC portion is in GOOD condition, with longitudinal cracks, some spalling of the joints and cracks, and sealant in moderate condition.

The Elephant Ear Apron is in GOOD condition. The predominant distresses are the typical longitudinal and transverse cracks which have been sealed (Photo 14).

B. Field Tests

All field test results are summarized in Appendix C, Core/Test Location Plan, and Appendix E, Summary of Physical Property Data. Dynamic Cone Penetrometer (DCP) tests were conducted at several locations on the airfield to evaluate the subgrade soil strength. The results of the DCP tests are shown on sheet C-2 in the appendix. The tests indicated the base course and subgrade layers are quite strong, with a CBR generally over 50 percent within the depths tested.

C. Laboratory Tests

The concrete flexural strength used for each feature is the average value of all flexural strength tests for cores taken from that particular feature. The average flexural strengths ranged from 600 to 830 psi. No abnormalities in the core samples were observed by the technician during laboratory testing. Soil samples were classified in the laboratory using the Unified Soil Classification System. The flexural strength for each core is shown on the Core Location Plan, Appendix C. PCC core test results and soil grain size distribution graphs are also summarized in Appendix E.

D. Summary of Allowable Gross Loads

The AGLs are listed in Appendix F for each feature. The Related Data Table in Appendix G is needed to read and

understand the AGL Table. It describes the different Aircraft Group Indicies and Pass Intensity Levels. An "A" on the AGL Table indicates the AGL is below the minimum weight of any aircraft in that group. A "+" indicates the AGL is higher than the maximum weight of any aircraft in that group.

The airfield pavements generally have adequate structural capacity to support the current levels of aircraft traffic. However, many areas including some primary pavements have load limitations for some aircraft. The current traffic is roughly equivalent to 1200 passes per year of a 125,000 pound B-737. (An estimate of current traffic is given on page 4 of this report. The various aircraft passes were converted to equivalent passes of a B-737 using the computer program "TRAFFIC"). The runway will structurally support the current traffic except for the southeast touchdown area, Feature R9B, which is somewhat weak and is likely to only last five or ten years. The majority of the heavier aircraft belong to private companies and use the civilian aprons and taxiways. The Air Force pavements see much lower traffic levels. Some of the Alert Area taxiways and aprons are somewhat weak, and are overloaded by F-15 aircraft when those aircraft are loaded to 43 to 50 kips or more. Feature A3B is weak, but is likely to have very few passes over it because of its location. The asphalt taxiways are also weak, but could last another five to ten years at current low traffic levels. The Transient Apron and access taxiways (A4B, A5B, T3B, T5B) are all quite weak and are overloaded by cargo and tanker aircraft at their normal range of weights. Since there have been so few passes of heavier cargo aircraft in the past, these features have held up reasonably well. To prolong the pavement life, recommend the number of C-141, KC-135, and C-5 passes and/or gross weight be kept to a minimum. These pavements can support very few passes without significant reduction to the pavement life.

Appendix F contains a separate AGL Table for use during the spring thaw. The AGLs in that table take into account the detrimental effects of frost action and are significantly lower than the regular AGLs. The magnitude of the difference depends on the frost susceptibility of the soil layers within the pavement system. At King Salmon Airport, there are several areas where the soils are frost susceptible. The lower AGLs should be used during spring thaw to control overloading and damage to the pavements.

PRIMARY PAVEMENT STRUCTURAL CAPACITY SUMMARY

The Primary Pavement Structural Capacity Summary pertains only to those airfield pavements considered primary, or the minimum required for mission accomplishment. For the purposes of this report, the primary pavement features include:

R1A, R2A, R3C, R5C, R7C, R9A, T1A, T2A, T3A, T4A, A1B, A2B, A3B, A4B, A5B, (shown on Appendix Sheet A-2)

MAXIMUM ALLOWABLE GROSS LOADS (AGLs) IN KIPS FOR PASS INTENSITY LEVEL I OPERATIONS

AIRCRAFT*	INDEX	APRONS(A3B)**	TAXIWAYS(T1A)**	RUNWAYS(R9A)**
C-123	1	+	+	+
F-15	2	21	24	46
FB-111	3	A	A	55
C-130	4	81	103	142
C-9	5	57	65	89
T-43	6	A	70	96
727	7	A	A	107
E-3	8	129	142	230
B-1	9	A	A	218
C-5	10	411	409	643
KC-10	11	A	272	392
E-4	12	A	408	567
B-52	13	A	A	208

LEGEND

Pass Intensity Level I for Aircraft Group Indices 1-3 = 300,000 Passes

Pass Intensity Level I for Aircraft Group Indices 4-10 = 50,000 Passes

Pass Intensity Level I for Aircraft Group Indices 11-13 = 15,000 Passes

* A complete listing of aircraft groups, gear configuration, and controlling aircraft characteristics is provided in AFR 93-5, Chapter 2. A brief summary is provided in Appendix G.

** Structurally the weakest of the primary pavements and, therefore, the controlling feature for the indicated aircraft. See Appendix A for feature locations.

+ No weight restrictions apply. AGL exceeds the greatest possible gross weight of any aircraft in the group.

A Lowest possible gross weight of any aircraft within the group exceeds the AGL of the pavement. Pavement cannot support aircraft for Pass Intensity Level I.

SECTION VI: CONCLUSIONS/RECOMMENDATIONS

A. General

1. The asphalt pavements should be maintained by sealing the new cracks each year and replacing existing sealant as needed. Crack sealing is very important because it increases pavement life and reduces the possibility of FOD damage to aircraft. Eventually the pavements will need to be resurfaced. For a resurfacing project, recommend as a minimum the existing surface be milled off to remove the old crack sealant and to smooth out the surface, followed by a two inch thick overlay. Severe cracks should be repaired prior to the overlay. With this type of repair, reflective cracks are likely to appear within a few years, and must be sealed at that time. A better option, although more expensive, is to remove all of the asphalt pavement and replace it with new or recycled asphalt. The pavement will then be likely to last as much as five years before cracking begins if the right grade of asphalt cement is used and the pavement is constructed properly.

2. The primary pavements should be the first priority for crack sealing. Once those areas are sealed, the secondary pavements and overruns should have the cracks sealed to prolong their life.

3. Many of the asphalt cracks appear typical of cracking caused by cold temperatures. Although cold temperature cracking of asphalt is common in Alaska, the problem can be controlled by using the proper grade of asphalt cement in paving projects. The Army Corps of Engineers Technical Letter 1110-1-139, dated 22 June 90, provides guidance on selecting asphalt for use in cold regions through use of the penetration-viscosity number (PVN) method. Use of asphalt meeting PVN requirements (minimum PVN of -0.2) is strongly recommended. For overlays, however, even if the proper grade of asphalt is used, the existing cracks will reflect through the pavement surface in a very short time. Tests of the asphalt cement to verify compliance should be done well in advance of a project so that alternate sources of asphalt cement can be obtained if necessary. When using the softer grades of asphalt, such as AC 2.5 or AC 5, the quality of the aggregate becomes important to prevent rutting problems during the summer. Using soft grades of asphalt generally will not result in a rutting problem if crushed aggregate is used with no natural sand, and the gradation is properly controlled.

B. Specific Recommendations

3. Recommend the utility patch on Taxiway 4 be repaired.

4. Recommend jet aircraft not taxi up Runway 18-36 and across the overrun to Taxiway 4 because of the FOD hazard

5. Recommend the PCC pavements be scheduled for a project consisting of spall repair, crack sealing, and joint seal replacement. The 11 end of Runway 11-29 is particularly in need of this type repair, but all of the PCC pavements at least need to have the joint sealant replaced within the next two years. The deterioration of the surface of some slabs on the 11 end of the runway should be monitored. If the condition continues to degrade, the affected slabs or the whole feature will have to be replaced.

GLOSSARY

Allowable Gross Load (AGL) - The maximum aircraft load that can be supported by a pavement feature for a particular number of passes.

Base or Subbase Courses - Natural or processed materials placed on the subgrade beneath the pavement.

Compacted Subgrade - The upper part of the subgrade, which is compacted to a density greater than the portion of the subgrade below.

Feature - A unique portion of the airfield pavement distinguished by traffic area, pavement type, pavement surface thickness and strength, soil layer thicknesses and strengths, construction period, and surface condition.

Frost Evaluation - Pavement evaluation during the frost-melting period, when the pavement load-carrying capacity will be reduced unless protection has been provided against detrimental frost action in underlying soils. Pass Intensity Levels V and VI are used with reduced subgrade strengths to determine the maximum allowable loads during the frost-melt period.

Pass - On a runway, the movement of an aircraft over an imaginary line 500 feet down from the approach end. On a taxiway, the movement of an aircraft over an imaginary line connecting an apron with the runway. AFR 93-5, Chapter 2.

Pass Intensity Levels (PIL) - Specific repetitions of aircraft over a pavement feature, regardless of time, that are dependent on aircraft design category. AFR 93-5, Chapter 2.

Pavement Condition Index (PCI) - A numerical indicator between 0 and 100 that reflects the surface operational condition of the pavement. AFR 93-5, Chapter 3.

Primary Pavements - Those features that are absolutely necessary for mission aircraft operations. AFR 93-5, Chapter 4.

Subgrade - The natural soil in-place, or fill material, upon which a pavement, base, or subbase course is constructed.

Type A Traffic Areas - Type A Traffic Areas are those pavement facilities that receive the channelized traffic and full design weight of the aircraft. AFM 88-6, Chapter 1.

Type B Traffic Areas - Type B Traffic Areas are considered to be those areas where traffic is more nearly uniform over the full width of the pavement facility, but which receive the full design weight of the aircraft. AFM 88-6, Chapter 1.

Type C Traffic Areas - Type C Traffic Areas are considered to be those on which the volume of traffic is low or the applied weight of the operating aircraft is less than the design weight. AFM 88-6, Chapter 1.

PAVEMENT CONDITION EVALUATION TERMINOLOGY

CONDITION RATING	DEFINITION
EXCELLENT	PAVEMENT HAS MINOR OR NO DISTRESS AND WILL REQUIRE ONLY ROUTINE MAINTENANCE.
VERY GOOD	PAVEMENT HAS SCATTERED LOW SEVERITY DISTRESSES WHICH SHOULD NEED ONLY ROUTINE MAINTENANCE.
GOOD	PAVEMENT HAS A COMBINATION OF GENERALLY LOW AND MEDIUM SEVERITY DISTRESSES. MAINTENANCE AND REPAIR NEEDS SHOULD BE ROUTINE TO MAJOR IN THE NEAR-TERM.
FAIR	PAVEMENT HAS LOW, MEDIUM, AND HIGH SEVERITY DISTRESSES WHICH PROBABLY CAUSE SOME OPERATIONAL PROBLEMS. MAINTENANCE AND REPAIR NEEDS SHOULD RANGE FROM ROUTINE TO RECONSTRUCTION IN THE NEAR-TERM.
POOR	PAVEMENT HAS PREDOMINANTLY MEDIUM AND HIGH SEVERITY DISTRESSES CAUSING CONSIDERABLE MAINTENANCE AND OPERATIONAL PROBLEMS. NEAR-TERM MAINTENANCE AND REPAIR NEEDS WILL BE INTENSIVE.
VERY POOR	PAVEMENT HAS MAINLY HIGH SEVERITY DISTRESSES WHICH CAUSE OPERATIONAL RESTRICTIONS. REPAIR NEEDS ARE IMMEDIATE.
FAILED	PAVEMENT DETERIORATION HAS PROGRESSED TO THE POINT THAT SAFE AIRCRAFT OPERATIONS ARE NO LONGER POSSIBLE. COMPLETE RECONSTRUCTION IS REQUIRED.

CONVERSION FACTORS

BRITISH TO INTERNATIONAL SYSTEMS (SI) OF UNITS

British units of measurements are used in this report and can be converted to SI (Metric) units as follows:

TO CONVERT	TO	MULTIPLY BY
LENGTH		
inch (in)	millimetre (mm)	25.400
inch (in)	metre (m)	0.0254
foot (ft)	metre (m)	0.305
yard (yd)	metre (m)	0.915
mile (mi)	kilometre (km)	1.609
AREA		
square inch (in^2)	square millimetre (mm^2)	645.2
square inch (in^2)	square metre (m^2)	0.0006452
square foot (ft^2)	square metre (m^2)	0.093
square yard (yd^2)	square metre (m^2)	0.8361
square mile (mi^2)	square kilometres (km^2)	2.59
acres	square kilometres (km^2)	0.004046
VOLUME		
cubic inch (in^3)	cubic millimetre (mm^3)	16487.0
cubic foot (ft^3)	cubic metre (m^3)	0.028
cubic yard (yd^3)	cubic metre (m^3)	0.7646
MASS		
pound (lb)	kilogram (kg)	0.454
FORCE		
pound (lb f)	newton (n)	4.448
kip (1000 lb f)	kilogram (kg)	453.6
STRESS		
pound per square inch (psi)	kilo Pascals (kPa)	6.895
MODULUS OF SUBGRADE REACTION (K-VALUE)		
pounds per square inch per inch (psi/in)	kilo Pascals per millimetre (kPa/mm)	0.2715
DEGREES		
degrees Fahrenheit(^{o}F) ($F^{o}-32$)	degrees Celsius (^{o}C)	5/9
DENSITY		
pounds per cubic foot (pounds mass)	kilogram per cubic meter (kg/m^3)	16.052

REFERENCES

1. Report on Airfield Pavement Evaluation, King Salmon Airport, Alaska, U.S. Army Engineer District, Alaska, Corps of Engineers, Anchorage Alaska, May 1963.

2. AFM 89-3, Materials Testing, August 1987.

3. AFR 93-5, Procedures for US Army and US Air Force Airfield Pavement Condition Surveys, July 1989.

4. AFR 93-13, Air Force Airfield Pavement Evaluation Program, February 1990

5. Hammitt, G. M. III, Concrete Strength Relationships, Research Paper, Texas A&M University, College Station, Texas, December 1971.

6. FAA Advisory Circular 150/5335-5, Standardized Method of Reporting Airport Pavement Strength - PCN, 15 June 1983.

7. Aircraft Characteristics for Airfield Pavement Design and Evaluation, Air Force Engineering and Services Center, Tyndall AFB FL, May 1988.

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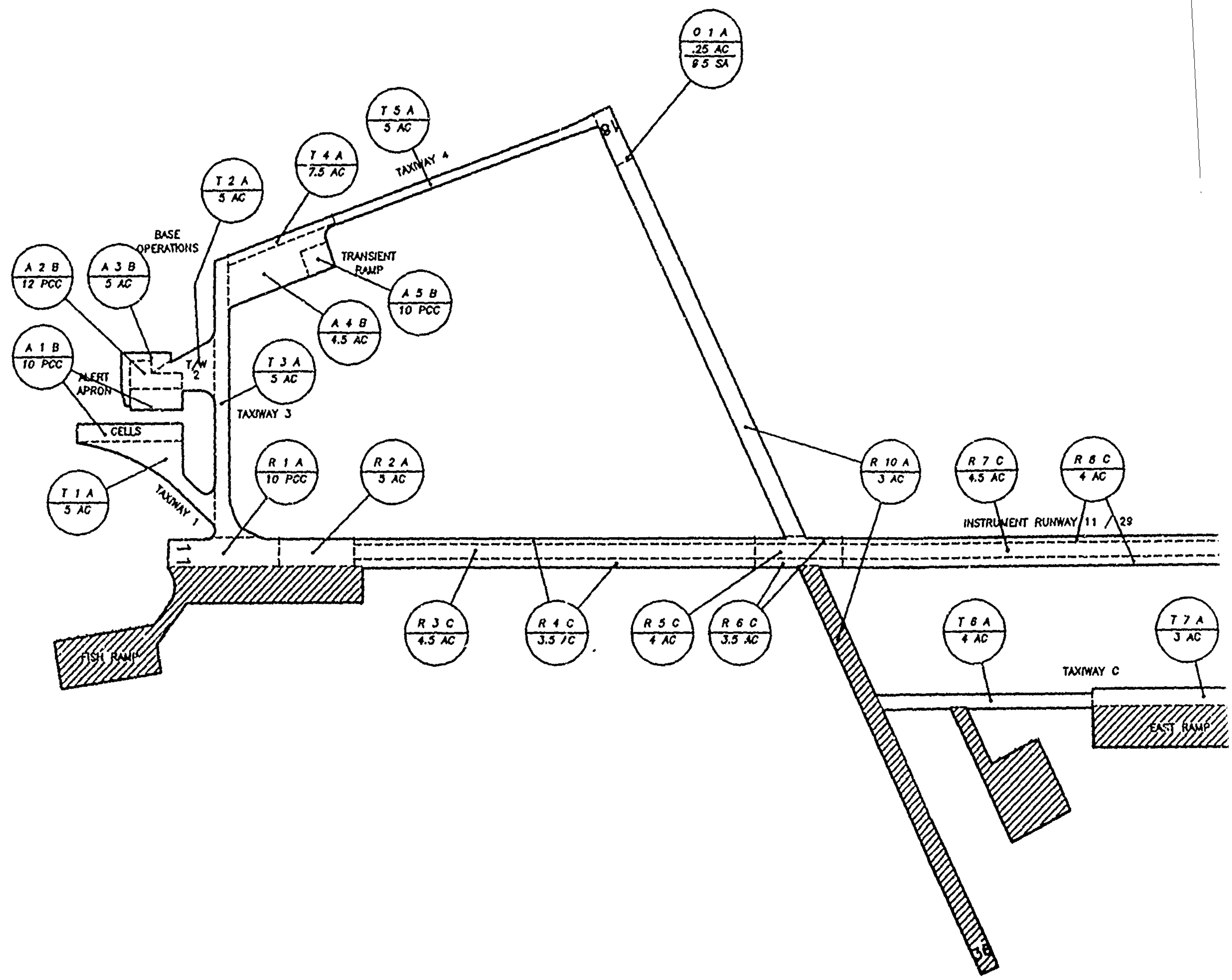
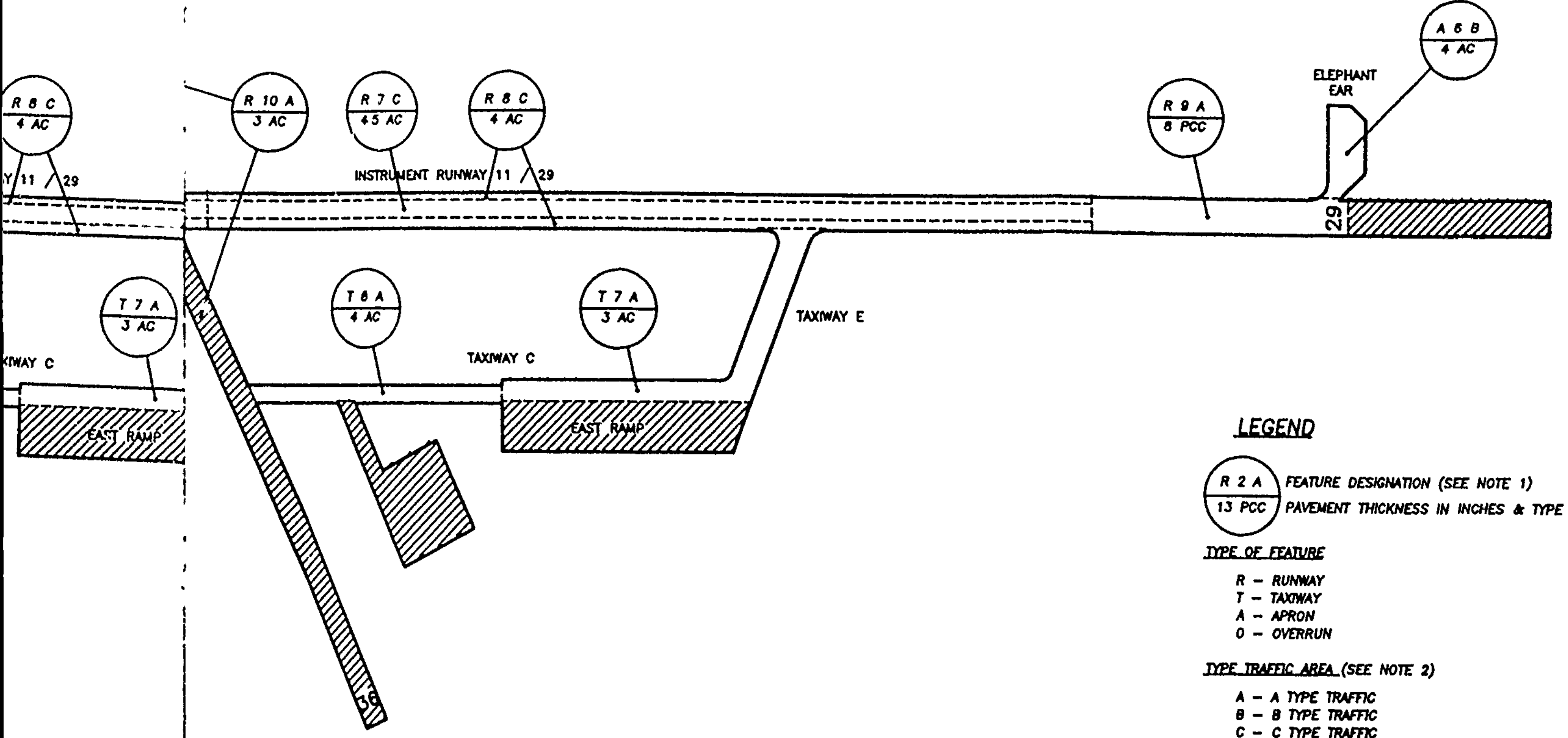


O 1 A
.25 AC
8.5 SA
T 5 A
5 AC
TAXIWAY 4
T 4 A
7.5 AC
T 2 A
5 AC
BASE OPERATIONS
TRANSIENT RAMP
A 2 B
12 PCC
A 3 B
5 AC
A 5 B
10 PCC
A 4 B
4.5 AC
A 1 B
10 PCC
ALERT APRON
T/W 2
T 3 A
5 AC
TAXIWAY 3
CELLS
T 1 A
5 AC
TAXIWAY 1
R 1 A
10 PCC
R 2 A
5 AC
R 10 A
3 AC
R 7 C
4.5 AC
R 8 C
4 AC
INSTRUMENT RUNWAY 11 / 29
11
18
36
R 3 C
4.5 AC
R 4 C
3.5 AC
R 5 C
4 AC
R 6 C
3.5 AC
T 6 A
4 AC
T 7 A
3 AC
TAXIWAY C
EAST RAMP
FISH RAMP



LEGEND

R 2 A — FEATURE DESIGNATION (SEE NOTE 1)
13 PCC — PAVEMENT THICKNESS IN INCHES & TYPE

TYPE OF FEATURE

R – RUNWAY
T – TAXIWAY
A – APRON
O – OVERRUN

TYPE TRAFFIC AREA (SEE NOTE 2)

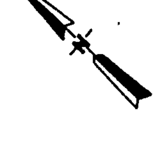
A – A TYPE TRAFFIC
B – B TYPE TRAFFIC
C – C TYPE TRAFFIC

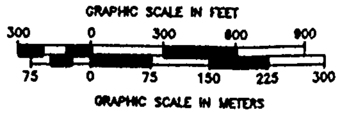
– – – – CHANGE IN FEATURE DESIGNATION
AC ASPHALTIC CONCRETE
PCC PORTLAND CEMENT CONCRETE
SA SAND ASPHALT

NOT EVALUATED

NOTES:

1. FEATURE DESIGNATION DENOTES TYPE OF FEATURE, NUMBER OF FEATURE FOR GIVEN FEATURE TYPE AND TYPE TRAFFIC AREA.
2. TRAFFIC AREA DESIGNATIONS ARE BASED ON AFM 88-6, CHAP. 1.
3. FEATURE DESINATIONS DO NOT CORRESPOND WITH THOSE FROM PREVIOUS REPORTS AND DRAWINGS.





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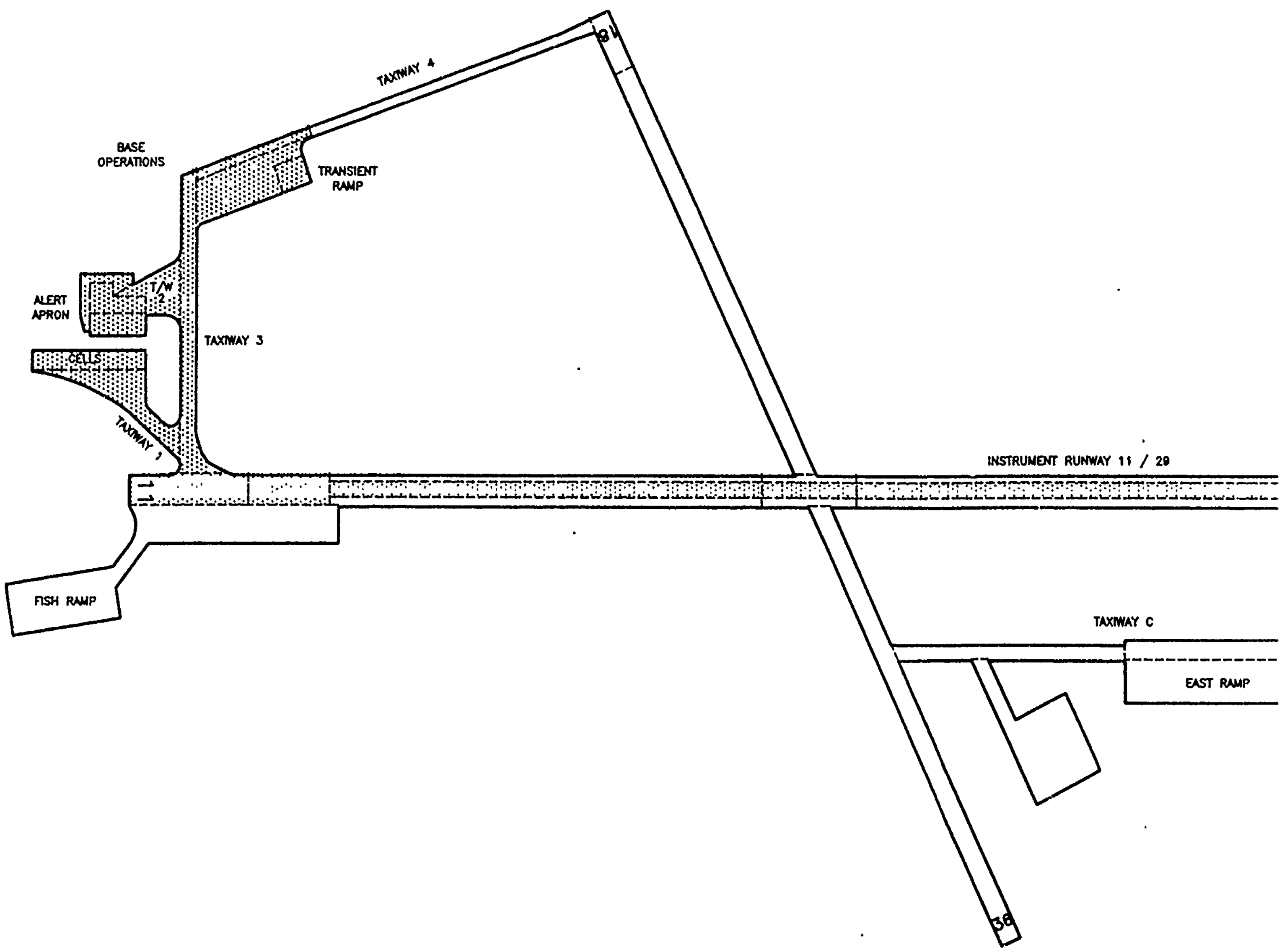
TYNDALL AIR FORCE BASE, FLORIDA

AIRFIELD LAYOUT PLAN

KING SALMON AIRPORT, ALASKA

	ENGINEER	DATE	DRAWING NUMBER
	CHRISTIANSEN	JAN 1992	APPENDIX A
A–1	DRAWN: BLANDING	SCALE: GRAPHIC	SHEET 1 OF 2


TAXIWAY 4
BASE OPERATIONS
TRANSIENT RAMP
ALERT APRON
T/W 2
TAXIWAY 3
CELLS
TAXIWAY 1
INSTRUMENT RUNWAY 11 / 29
FISH RAMP
TAXIWAY C
EAST RAMP
18
36
11

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A
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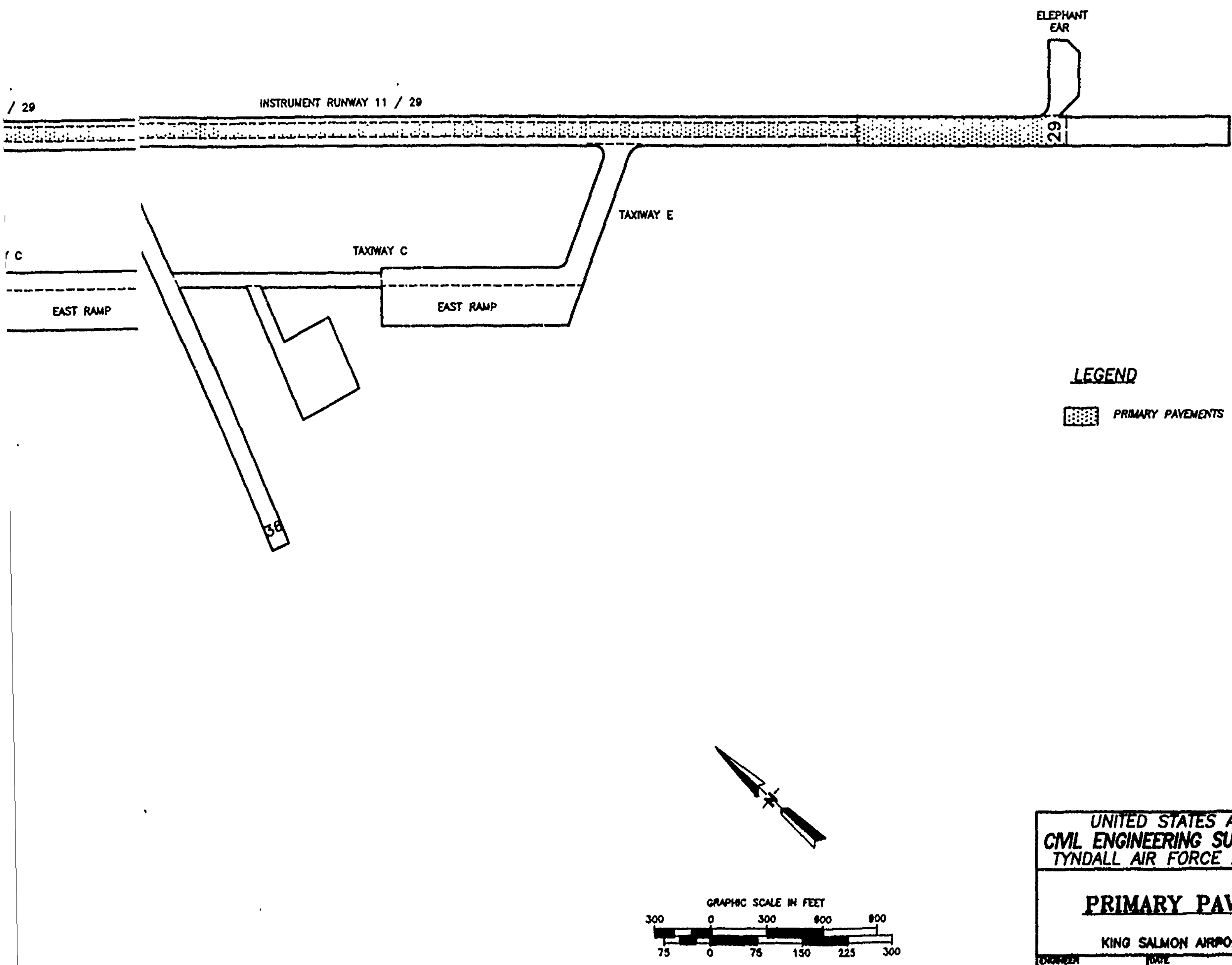

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PRIMARY PAVEMENTS

KING SALMON AIRPORT, ALASKA

	ENGINEER	DATE	DRAWING NUMBER
	CHRISTIANSEN	JAN 1992	APPENDIX A
A–2	DRAWN BLANDING	SCALE GRAPHIC	SHEET 2 OF 2

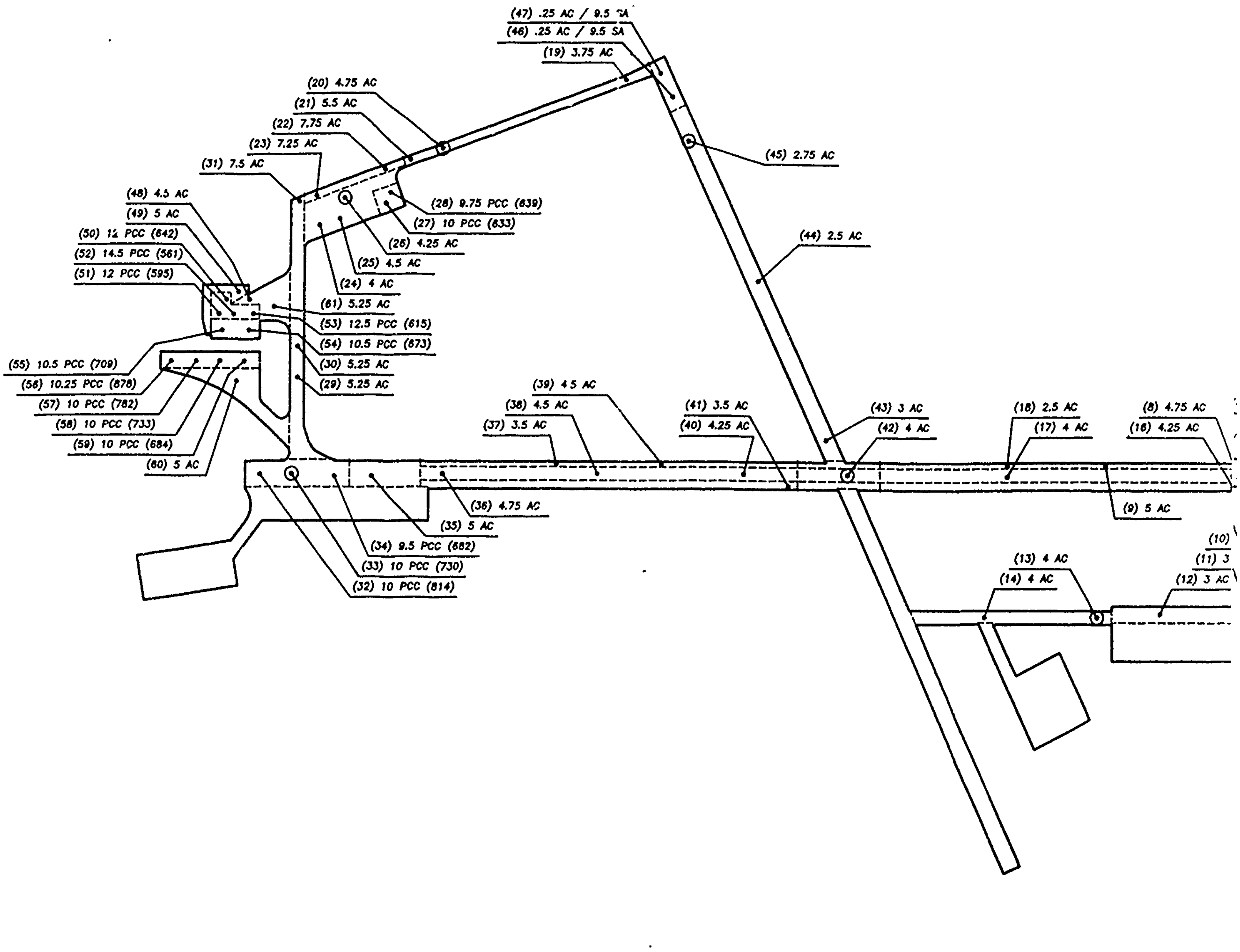
CONSTRUCTION HISTORY

KING SALMON AIRPORT, ALASKA

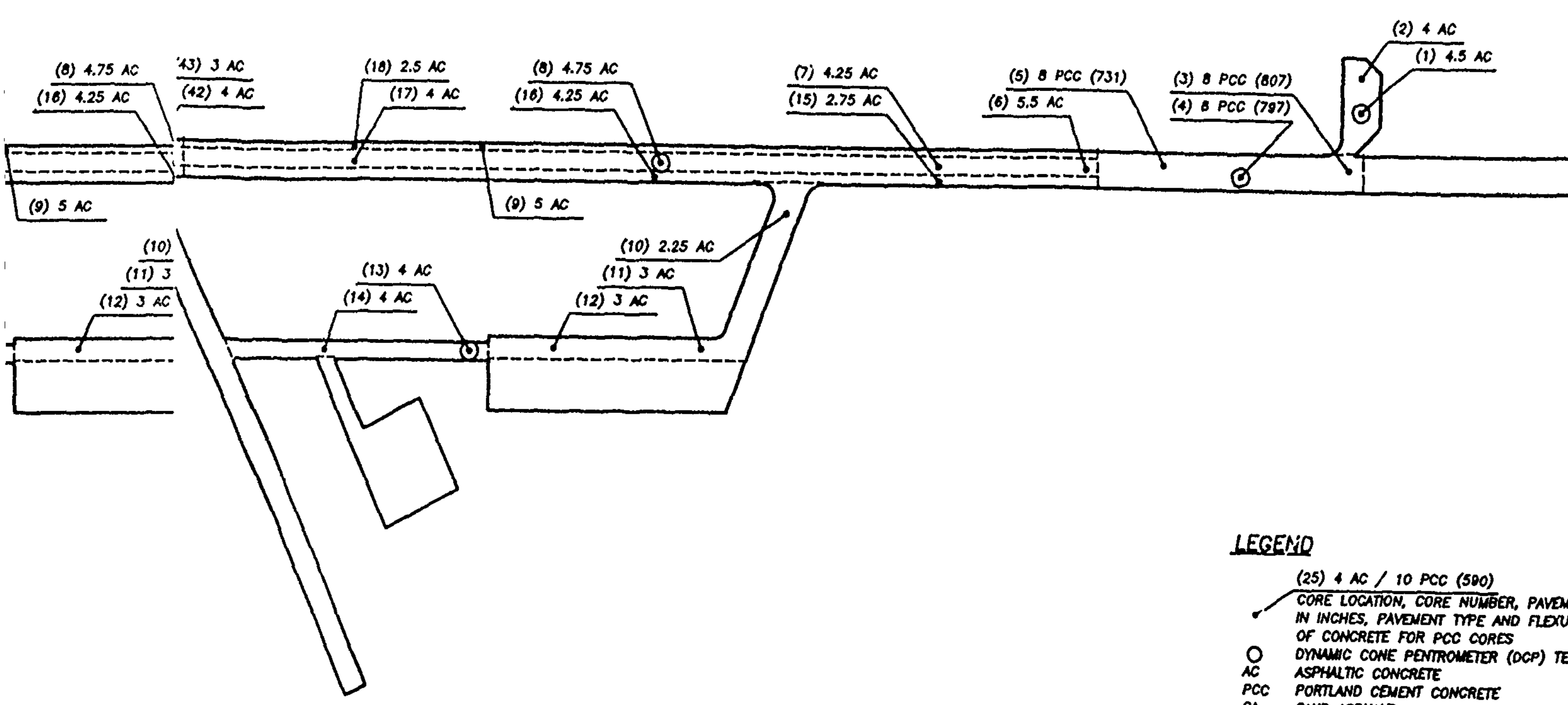
	FEATURE DESCRIPTION	APPROXIMATE CONSTRUCTION PERIOD	TYPE & THICKNESS (in.)	REMARKS
R01A	NW TOUCHDOWN AREA RUNWAY 11-29	1941-42	5 AEBC	ORIGINAL CONSTRUCTION, CAA (FAA)
		1942-43	5 AEBC	RECONSTRUCTION/REHABILITATION, CAA (FAA)
		1944	3 AEBC	OVERLAY, CAA (FAA)
		1953-54	1.5-3 AEBC	OVERLAY, CORPS OF ENGINEERS
		1958	10 PCC	RECONSTRUCTED, CORPS OF ENGINEERS
		1970	-	RESEAL CRACKS AND JOINTS, COE
R02A	NW TOUCHDOWN AREA RUNWAY 11-29	1941-42	5 AEBC	ORIGINAL CONSTRUCTION, CAA (FAA)
		1942-43	5 AEBC	RECONSTRUCTION/REHABILITATION, CAA (FAA)
		1944	3 AEBC	OVERLAY, CAA (FAA)
		1953-54	1.5-3 AEBC	OVERLAY, CORPS OF ENGINEERS
		1958	4 AC	RECONSTRUCTION, CORPS OF ENGINEERS
		1981	5 AC	RECONSTRUCTION, CORPS OF ENGINEERS
R03C	RUNWAY 11-29 INTERIOR (KEEL SECTION)	1941-42	5 AEBC	ORIGINAL CONSTRUCTION, CAA (FAA)
		1942-43	5 AEBC	RECONSTRUCTION/REHABILITATION, CAA (FAA)
		1944	3 AEBC	OVERLAY, CAA (FAA)
		1953-54	1.5-3 AEBC	OVERLAY, CORPS OF ENGINEERS
		1958	4 AC	RECONSTRUCTION, CORPS OF ENGINEERS
		1981	4.5 AC	RECONSTRUCTION, CORPS OF ENGINEERS
R04C	RUNWAY 11-29 INTERIOR (EDGE SECTIONS)	1941-42	5 AEBC	ORIGINAL CONSTRUCTION, CAA (FAA)
		1942-43	5 AEBC	RECONSTRUCTION/REHABILITATION, CAA (FAA)
		1944	3 AEBC	OVERLAY, CAA (FAA)
		1953-54	1.5-3 AEBC	OVERLAY, CORPS OF ENGINEERS
		1958	4 AC	RECONSTRUCTION, CORPS OF ENGINEERS
		1981	3.5 AC	RECONSTRUCTION, CORPS OF ENGINEERS
R05C	RUNWAY 11-29 + 18/36 INTERSECTION SECTIONS	1941-42	5 AEBC	ORIGINAL CONSTRUCTION, CAA (FAA)
		1942-43	5 AEBC	RECONSTRUCTION/REHABILITATION, CAA (FAA)
		1944	3 AEBC	OVERLAY, CAA (FAA)
		1953-54	1.5-3 AEBC	OVERLAY, CORPS OF ENGINEERS
		1958	4 AC	RECONSTRUCTION, CORPS OF ENGINEERS
		1986	4 AC	RECONSTRUCTION, CORPS OF ENGINEERS
R06C	RUNWAY 11-29 INTER-SECTION EDGES	1941-42	5 AEBC	ORIGINAL CONSTRUCTION, CAA (FAA)
		1942-43	5 AEBC	RECONSTRUCTION/REHABILITATION, CAA (FAA)
		1944	3 AEBC	OVERLAY, CAA (FAA)
		1953-54	1.5-3 AEBC	OVERLAY, CORPS OF ENGINEERS
		1958	4 AC	RECONSTRUCTION, CORPS OF ENGINEERS
		1986	3.5 AC	RECONSTRUCTION, CORPS OF ENGINEERS

	FEATURE DESCRIPTION	APPROXIMATE CONSTRUCTION PERIOD	TYPE & THICKNESS (in.)	REMARKS
R07C	RUNWAY 11-29 INTERIOR	1941-42	5 AEBC	ORIGINAL CONSTRUCTION, CAA (FAA)
	(KEEL SECTION)	1942-43	5 AEBC	RECONSTRUCTION/REHABILITATION, CAA (FAA)
		1944	3 AEBC	OVERLAY, CAA (FAA)
		1953-54	1.5-3 AEBC	OVERLAY, CORPS OF ENGINEERS
		1958	4 AC	RECONSTRUCTION, CORPS OF ENGINEERS
		1986	4 AC	RECONSTRUCTION, CORPS OF ENGINEERS
R08C	RUNWAY 11-29 INTERIOR	1941-42	5 AEBC	ORIGINAL CONSTRUCTION, CAA (FAA)
	(EDGES)	1942-43	5 AEBC	RECONSTRUCTION/REHABILITATION, CAA (FAA)
		1944	3 AEBC	OVERLAY, CAA (FAA)
		1953-54	1.5-3 AEBC	OVERLAY, CORPS OF ENGINEERS
		1958	4 AC	RECONSTRUCTION, CORPS OF ENGINEERS
		1986	4 AC	RECONSTRUCTION, CORPS OF ENGINEERS
R09A	SE TOUCHDOWN AREA	1944-45	5 AEBC	ORIGINAL CONSTRUCTION, CAA (FAA)
	RUNWAY 11-29 (29 END)	1944	3 AEBC	OVERLAY, CAA (FAA)
		1962	8 PCC	RECONSTRUCTION, US ARMY CORPS OF ENGINEERS
		1970	-	RESEAL CRACKS AND JOINTS, US ARMY COE
R10A	RUNWAY 18-36	1941-42	5 AEBC	ORIGINAL CONSTRUCTION, CAA (FAA)
		1942-43	5 AEBC	RECONSTRUCTION/REHABILITATION, CAA (FAA)
		1944	3 AEBC	OVERLAY, CAA (FAA)
		1953-54	1.5-3 AEBC	OVERLAY, CORPS OF ENGINEERS
		1958	3 AC	RECONSTRUCTION, CORPS OF ENGINEERS
		1990	3 AC	RECONSTRUCTION, 100' WIDE, STATE OF ALASKA
T01A	TAXIWAY 1	1956-57	3 AC	ORIGINAL CONSTRUCTION, CONTRACT DA-878
		1971	2 AC	OVERLAY, CORPS OF ENGINEERS
		1986	1.5 AC	REMOVE/REPLACE SURFACE COURSE, US ARMY COE
T02A	TAXIWAY 2	1956-57	3 AC	ORIGINAL CONSTRUCTION, CONTRACT DA-878
		1971	2 AC	OVERLAY, CORPS OF ENGINEERS
		1986	1.5 AC	REMOVE/REPLACE SURFACE COURSE, US ARMY COE
T03A	TAXIWAY 3	1956-57	3 AC	ORIGINAL CONSTRUCTION, CONTRACT DA-878
		1986	5 AC	RECONSTRUCTION, US ARMY CORPS OF ENGINEERS
T04A	TAXIWAY 4	1956-57	3 AC	ORIGINAL CONSTRUCTION, CONTRACT DA-878
		1971	2 AC	OVERLAY, CORPS OF ENGINEERS
		1986	2.5 AC	REMOVE/REPLACE SURFACE, US ARMY COE
T05A	TAXIWAY 4	1956-57	3 AC	ORIGINAL CONSTRUCTION, CONTRACT DA-878
		1971	2 AC	OVERLAY, CORPS OF ENGINEERS
T06A	TAXIWAY 'C'	1985	4 AC	ORIGINAL CONSTRUCTION, STATE OF ALASKA

	FEATURE DESCRIPTION	APPROXIMATE CONSTRUCTION PERIOD	TYPE & THICKNESS (in.)	REMARKS
T07A	TAXIWAY 'E'	1972	3 AC	ORIGINAL CONSTRUCTION, STATE OF ALASKA
A01B	ALERT HANGAR ACCESS APRON	1955-57	10 PCC	ORIGINAL CONSTRUCTION, US ARMY COE
A02B	ALERT HANGAR ACCESS APRON	1956-57	12 PCC	ORIGINAL CONSTRUCTION, US ARMY COE
A03B	ALERT HANGAR ACCESS APRON EXTENSION	1986	5 AC	ORIGINAL CONSTRUCTION, US ARMY COE
A04B	TRANSIENT RAMP	1956-57 1971 1986	3 TR 1.5 AC 1.5 AC	ORIGINAL CONSTRUCTION, CONTRACT DA-878 OVERLAY, US ARMY CORPS OF ENGINEERS REMOVE/REPLACE SURFACE COURSE, US ARMY COE
A05B	TRANSIENT RAMP	1956-57	10 PCC	ORIGINAL CONSTRUCTION, CONTRACT DA-878
A06B	ELEPHANT EAR	1972	4 AC	ORIGINAL CONSTRUCTION, US ARMY COE
O1A	OVERRUN, RUNWAY 18-36	1941-42 1942-43 1944 1953-54	5 AEBC 5 AEBC 3 AEBC 1.5-3 AEBC	ORIGINAL CONSTRUCTION, CAA (FAA) RECONSTRUCTION/REHABILITATION, CAA (FAA) OVERLAY, CAA (FAA) OVERLAY, CORPS OF ENGINEERS



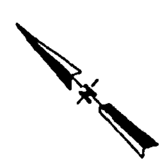
(47) .25 AC / 9.5
(46) .25 AC / 9.5 SA
(19) 3.75 AC
(20) 4.75 AC
(21) 5.5 AC
(22) 7.75 AC
(23) 7.25 AC
(31) 7.5 AC
(45) 2.75 AC
(28) 9.75 PCC (639)
(27) 10 PCC (633)
(26) 4.25 AC
(25) 4.5 AC
(24) 4 AC
(48) 4.5 AC
(49) 5 AC
(50) 12 PCC (642)
(52) 14.5 PCC (561)
(51) 12 PCC (595)
(44) 2.5 AC
(61) 5.25 AC
(53) 12.5 PCC (615)
(54) 10.5 PCC (673)
(30) 5.25 AC
(29) 5.25 AC
(55) 10.5 PCC (709)
(56) 10.25 PCC (678)
(57) 10 PCC (782)
(58) 10 PCC (733)
(59) 10 PCC (684)
(60) 5 AC
(39) 4.5 AC
(38) 4.5 AC
(37) 3.5 AC
(41) 3.5 AC
(40) 4.25 AC
(43) 3 AC
(42) 4 AC
(18) 2.5 AC
(17) 4 AC
(8) 4.75 AC
(16) 4.25 AC
(36) 4.75 AC
(35) 5 AC
(34) 9.5 PCC (682)
(33) 10 PCC (730)
(32) 10 PCC (814)
(9) 5 AC
(10)
(11) 3
(12) 3 AC
(13) 4 AC
(14) 4 AC

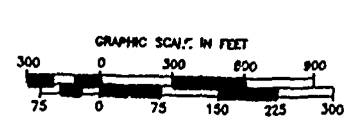


LEGEND

(25) 4 AC / 10 PCC (590)
CORE LOCATION, CORE NUMBER, PAVEMENT THICKNESS IN INCHES, PAVEMENT TYPE AND FLEXURAL STRENGTH OF CONCRETE FOR PCC CORES

- O — DYNAMIC CONE PENTROMETER (DCP) TEST LOCATION
- AC — ASPHALTIC CONCRETE
- PCC — PORTLAND CEMENT CONCRETE
- SA — SAND ASPHALT





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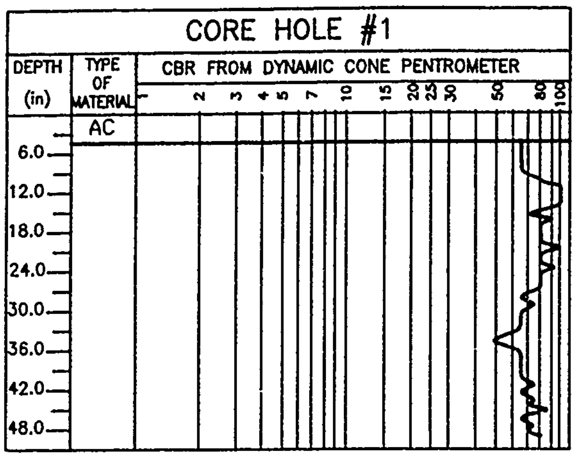
CORE / TEST LOCATIONS

KING SALMON AIRPORT, ALASKA

ENGINEER CHRISTIANSEN	DATE JAN 1992	DRAWING NUMBER APPENDIX C
DRAWN BLANDING	SCALE GRAPHIC	SHEET 1 OF 2

C-1

A 6 B



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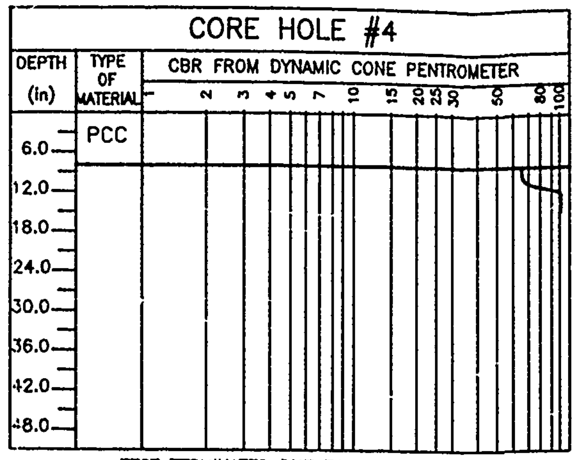
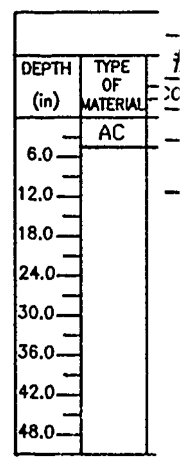


TEST TERMINATED DUE TO OBSTRUCTION



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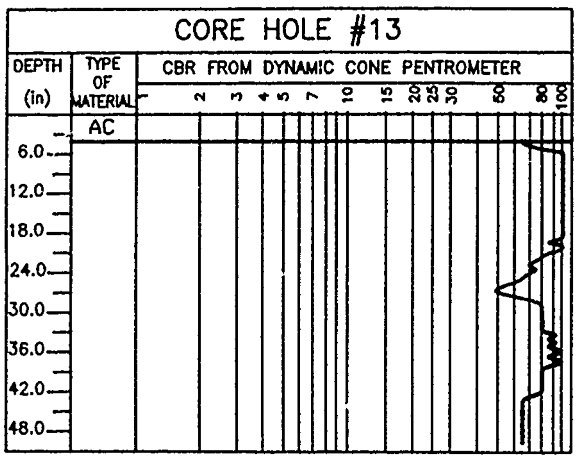

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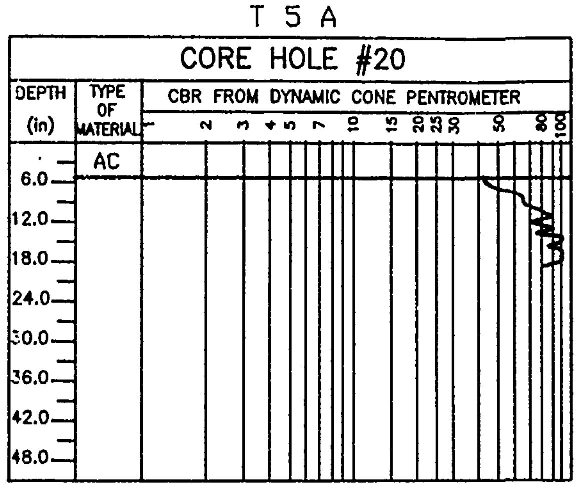

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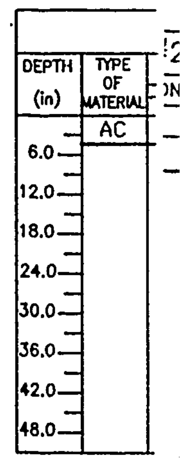

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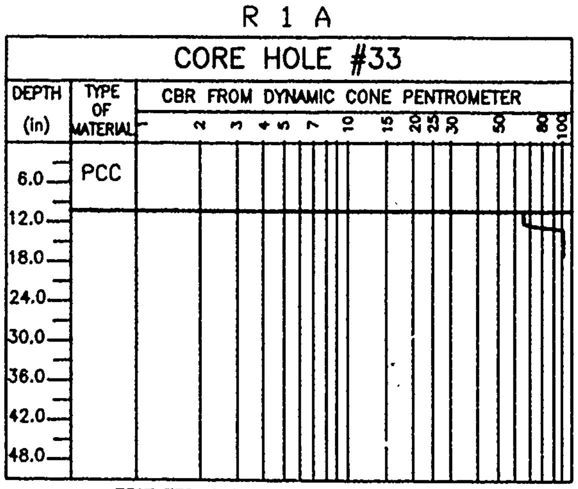

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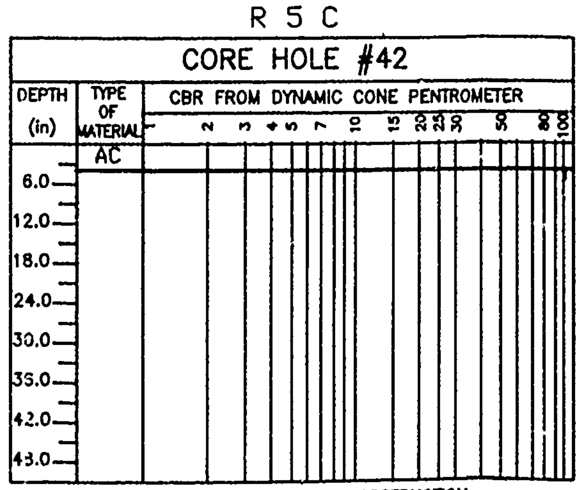
R 5 C



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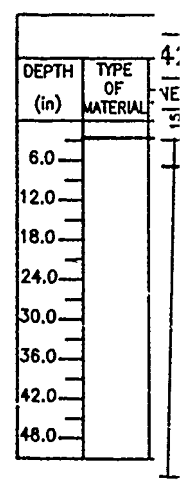

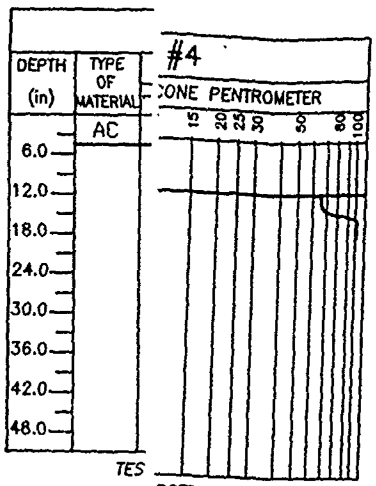

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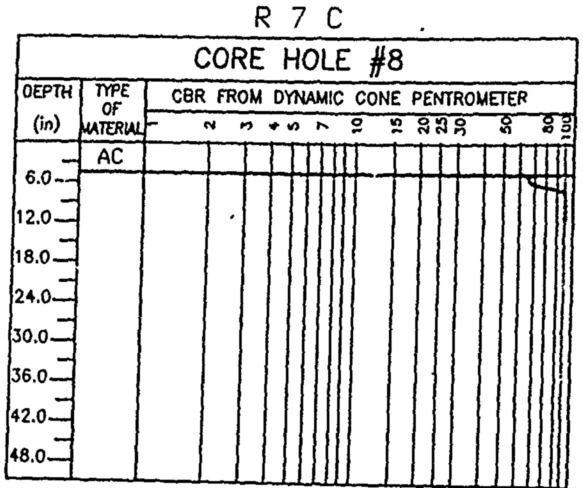
R 7 C



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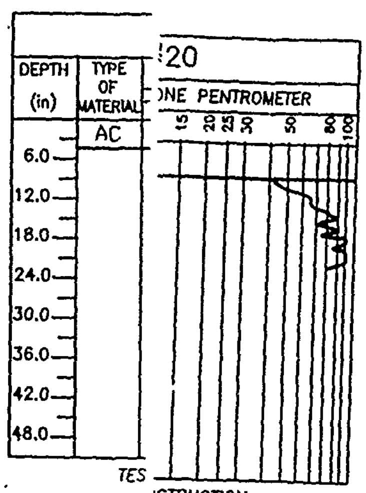

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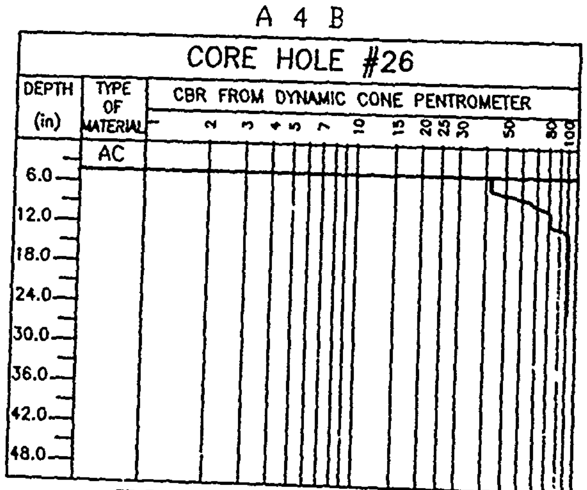

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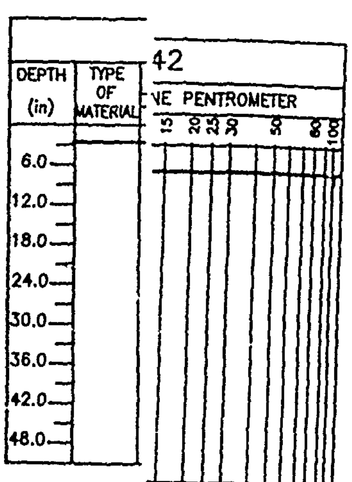

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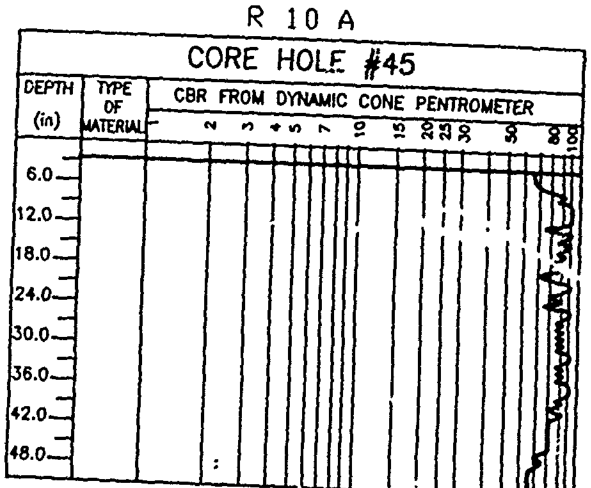

2.75 INCHES OF AC

LEGEND

CBR	CALIFORNIA BEARING RATIO
DCP	DYNAMIC CONE PENTROMETER
AC	ASPHALTIC CONCRETE
PCC	PORTLAND CEMENT CONCRETE

NOTES:

1. MAXIMUM CONE PENETRATION IN 50 INCHES BELOW PAVEMENT SURFACE.

UNITED STATES AIR FORCE
CIVIL ENGINEERING SUPPORT AGENCY
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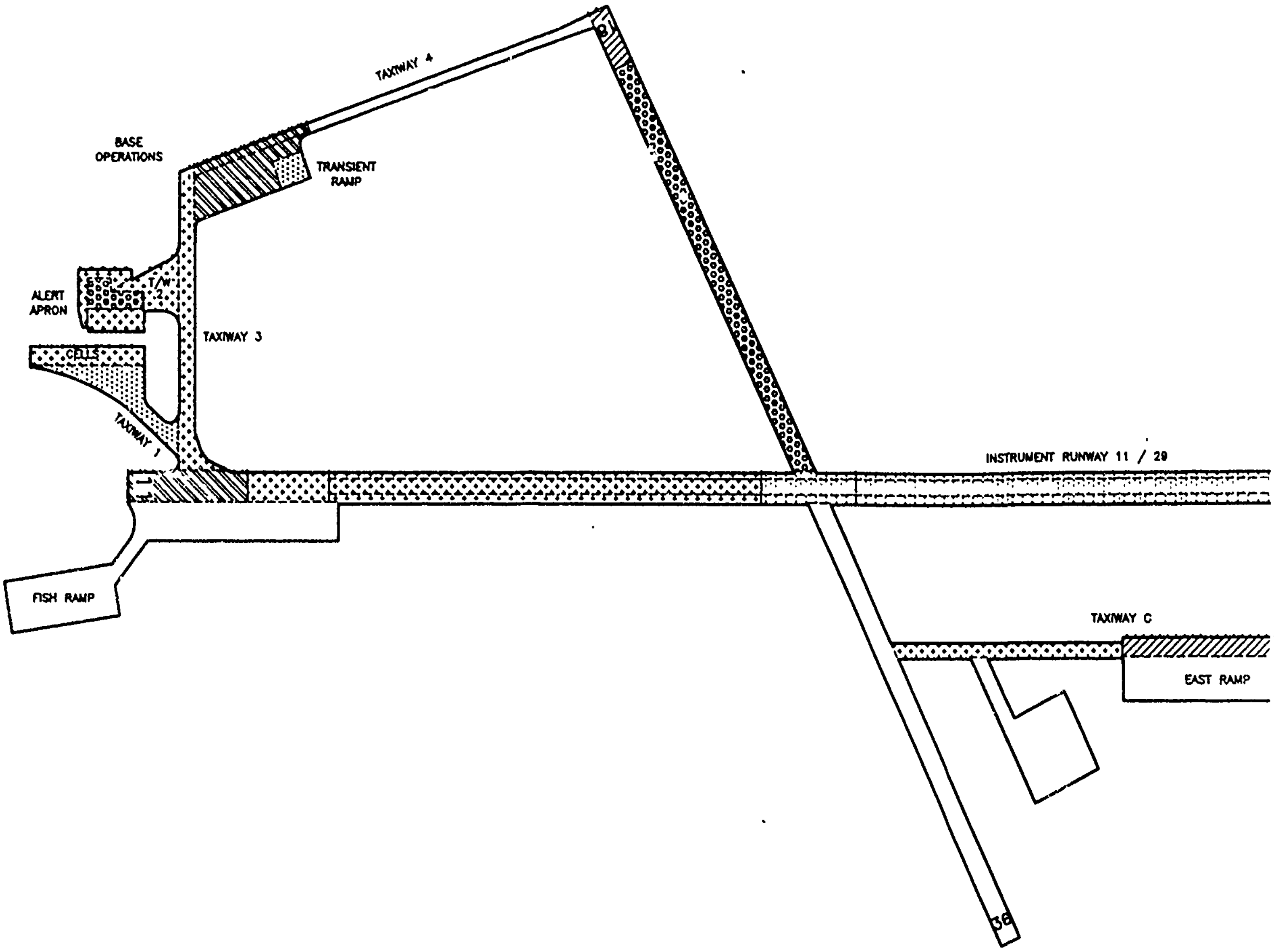
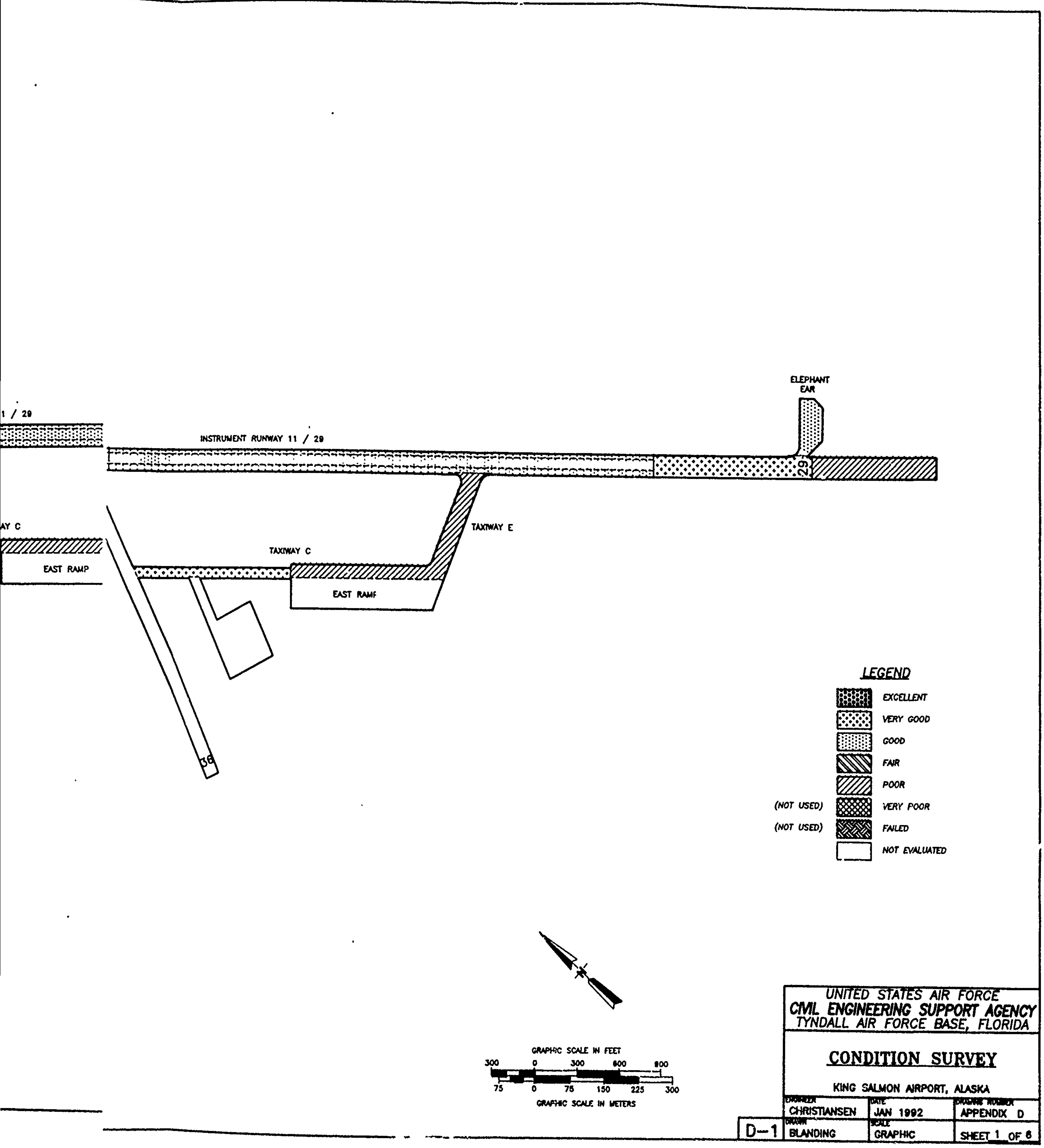
CORE HOLE / TEST LOCATION CROSS SECTIONS

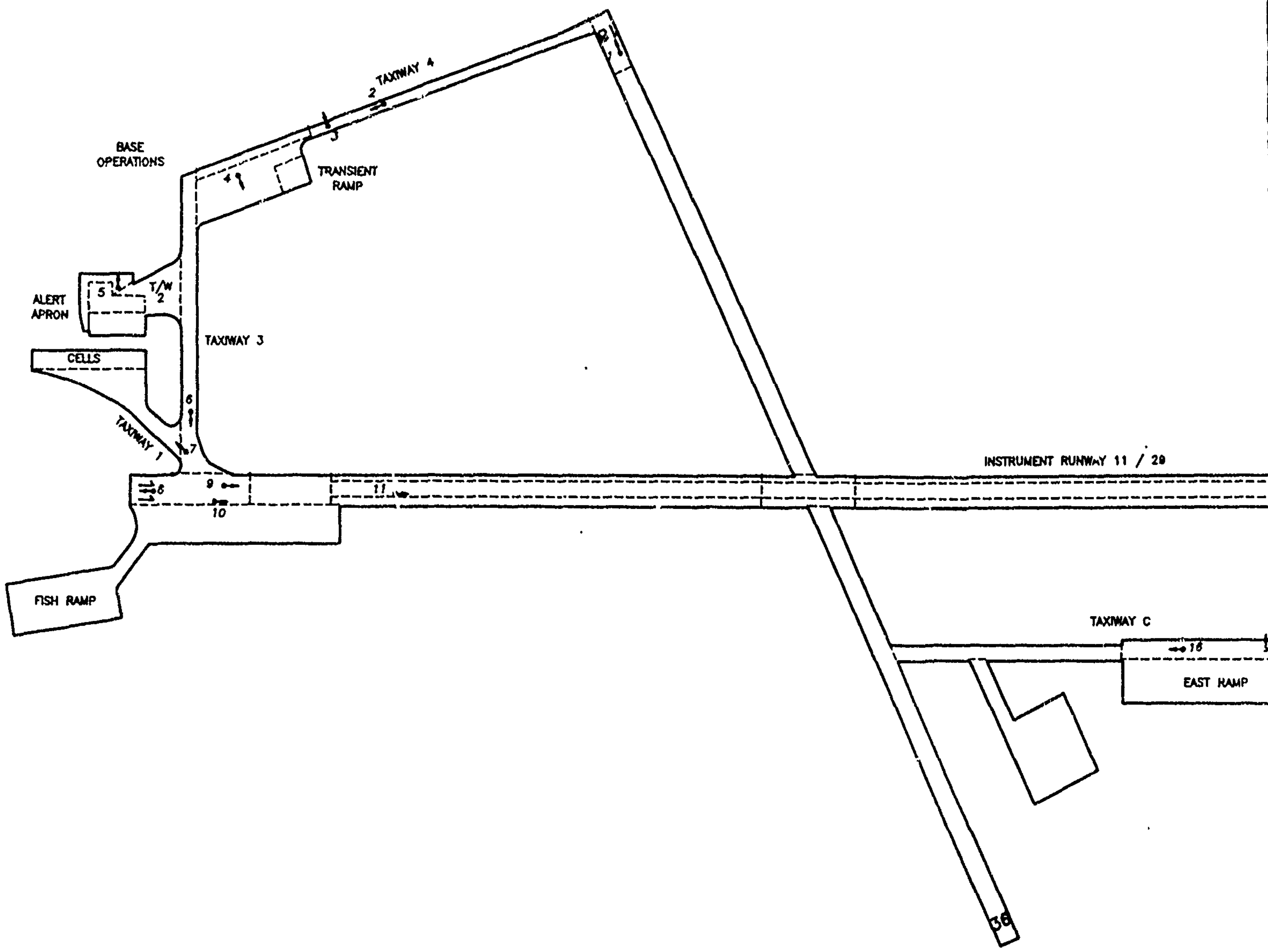
KING SALMON AIRPORT, ALASKA

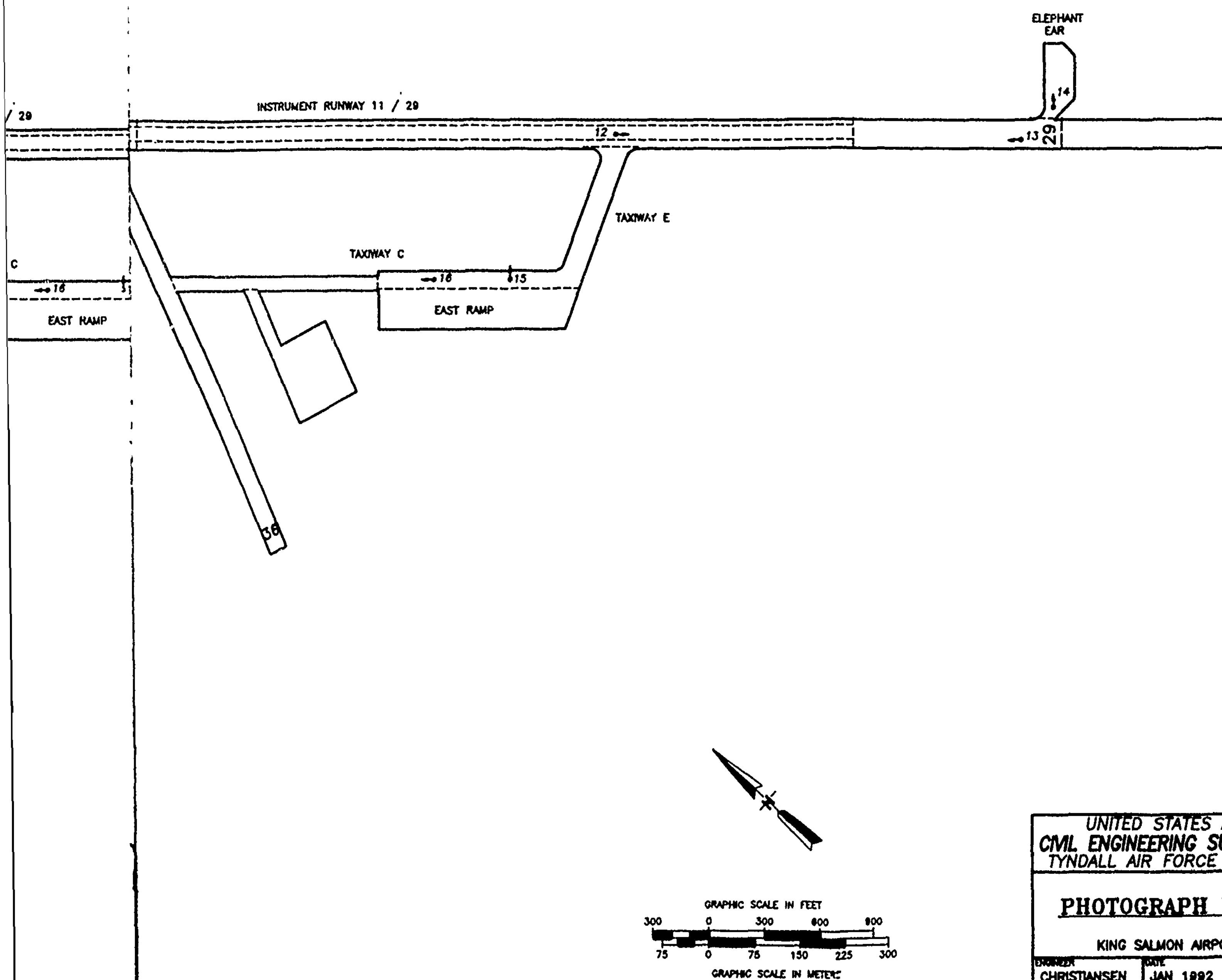
CHRISTIANSEN	JAN 1992	APPENDIX C
MESS'NA	NONE	SHEET 2 OF 2



TAXIWAY 4
BASE
OPERATIONS
TRANSIENT
RAMP
ALERT
APRON
T/W
2
TAXIWAY 3
CELLS
TAXIWAY 1
INSTRUMENT RUNWAY 11 / 29
FISH RAMP
TAXIWAY C
EAST RAMP
36


ELEPHANT EAR
1 / 29
INSTRUMENT RUNWAY 11 / 29
29
TAXIWAY E
AY C
TAXIWAY C
EAST RAMP
EAST RAMP
36
LEGEND
EXCELLENT
VERY GOOD
GOOD
FAIR
POOR
(NOT USED) VERY POOR
(NOT USED) FAILED
NOT EVALUATED
GRAPHIC SCALE IN FEET
300 0 300 600 900
75 0 75 150 225 300
GRAPHIC SCALE IN METERS
UNITED STATES AIR FORCE
CIVIL ENGINEERING SUPPORT AGENCY
TYNDALL AIR FORCE BASE, FLORIDA
CONDITION SURVEY
KING SALMON AIRPORT, ALASKA
CHRISTIANSEN
JAN 1992
APPENDIX D
D—1
BLANDING
GRAPHIC
SHEET 1 OF 6


TAXIWAY 4
BASE OPERATIONS
TRANSIENT RAMP
ALERT APRON
T/W 2
TAXIWAY 3
CELLS
TAXIWAY 1
INSTRUMENT RUNWAY 11 / 29
FISH RAMP
TAXIWAY C
EAST RAMP



UNITED STATES AIR FORCE
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TYNDALL AIR FORCE BASE, FLORIDA

PHOTOGRAPH LOCATIONS

KING SALMON AIRPORT, ALASKA

ENGINEER	DATE	DRAWING NUMBER
CHRISTIANSEN	JAN 1992	APPENDIX D
DRAWN	SCALE	
BLANDING	GRAPHIC	SHEET 2 OF 6

D–2

PHOTO 1 : BADLY DETERIORATED PAVEMENT ON THE NORTH END OF RUNWAY 18-36. PAVEMENT HAS ALLIGATOR AND BLOCK CRACKING.

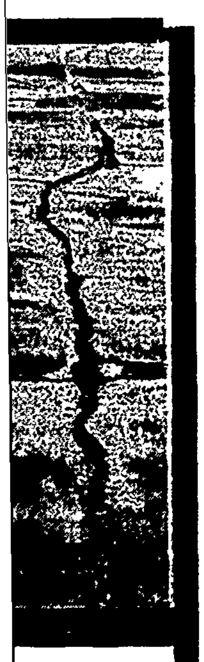
PHOTO 2 : BLOCK CRACKING, SHALLOW RUTS, AND THE BEGINN

PHOTO 3 : RUTTED UTILITY PATCH ON TAXIWAY 4.

PHOTO 4 : SPALLING TRANSVERSE CRACK ON TRANSIENT APRO

S, AND THE BEGINN

PHOTO 2 : BLOCK CRACKING, SHALLOW RUTS, AND THE BEGINNING OF ALLIGATOR CRACKS ON TAXIWAY 4.



N TRANSIENT APRO

PHOTO 4 : SPALLING TRANSVERSE CRACK ON TRANSIENT APRON.

UNITED STATES AIR FORCE
CIVIL ENGINEERING SUPPORT AGENCY
TYNDALL AIR FORCE BASE, FLORIDA

PHOTOGRAPHS

KING SALMON AIRPORT, ALASKA

CHRISTIANSEN	JAN 1992	APPENDIX D
BLANDING	NONE	SHEET 3 OF 6

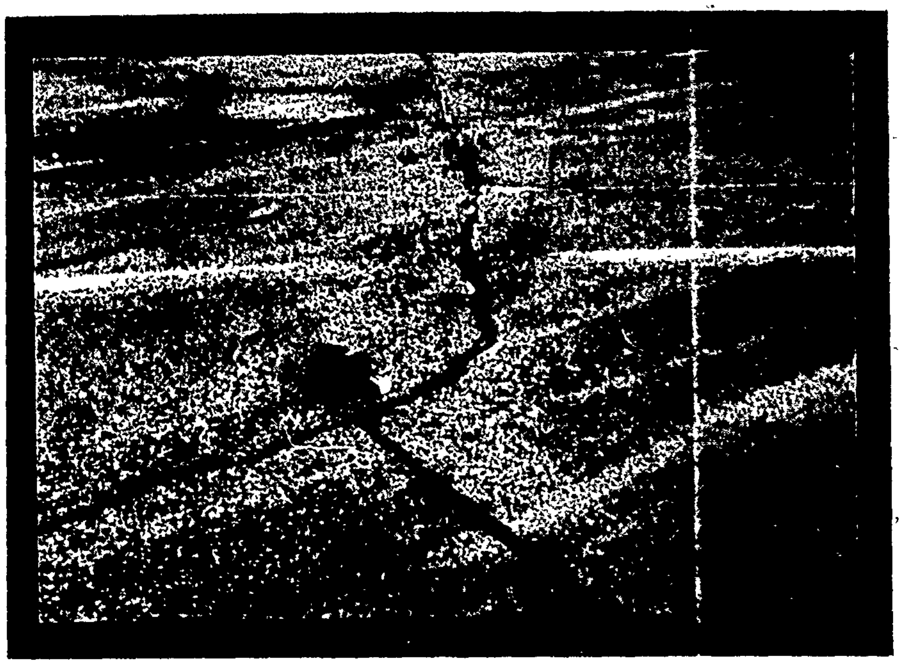


PHOTO 5 : MEDIUM SEVERITY LONGITUDINAL CRACK ON THE REAR ALERT APRON, WITH SEALANT IN POOR CONDITION.

PHOTO 6 : VOIDS IN THE SURFACE OF THE PAVEMENT WHERE AGG OF TAXIWAYS 1,2, AND 3.

PHOTO 7 : BIRD BATH AND SEALED CRACKS ON TAXIWAY 1.

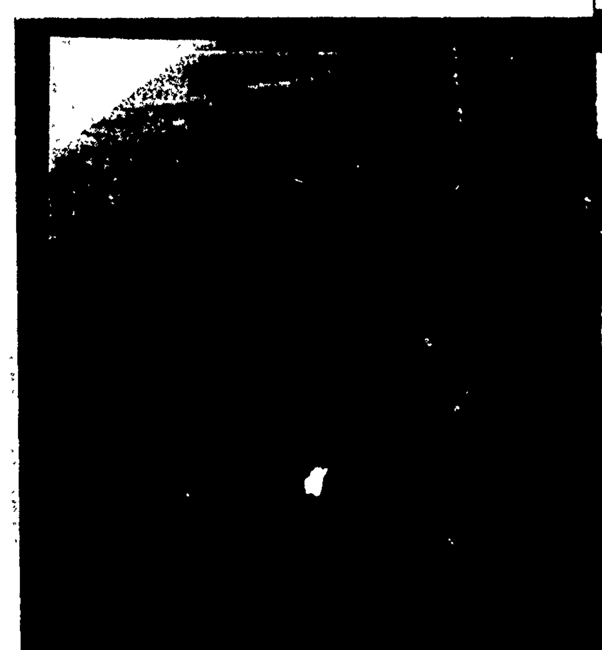


PHOTO 8 : HIGH SEVERITY SPALLING AT THE 11 END OF RUNWAY 1

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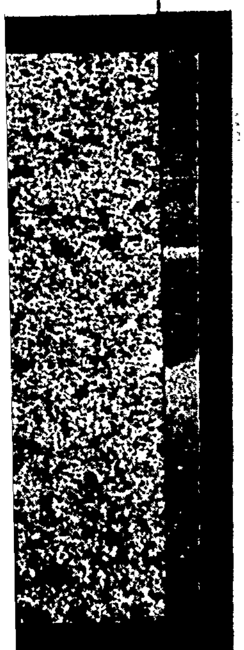


EMENT WHERE AGG N POOR

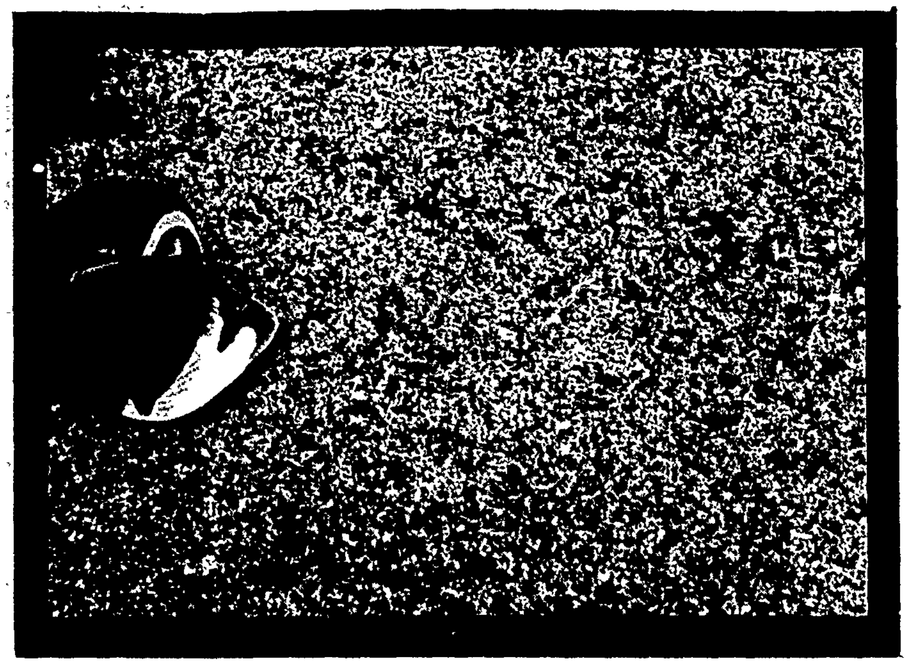
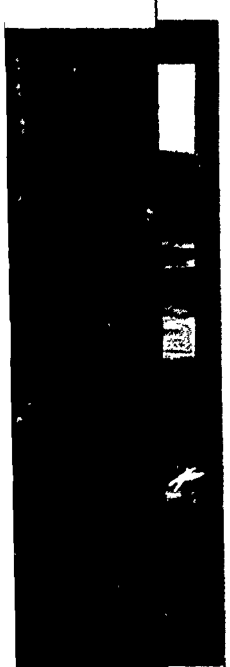


PHOTO 6 : VOIDS IN THE SURFACE OF THE PAVEMENT WHERE AGGREGATE IS MISSING. TYPICAL OF TAXIWAYS 1,2, AND 3.



ND OF RUNWAY 1

PHOTO 8 : HIGH SEVERITY SPALLING AT THE 11 END OF RUNWAY 11-29.

UNITED STATES AIR FORCE
CIVIL ENGINEERING SUPPORT AGENCY
TYNDALL AIR FORCE BASE, FLORIDA

PHOTOGRAPHS

KING SALMON AIRPORT, ALASKA

ENGINEER	DATE	DRAWING NUMBER
CHRISTIANSEN	JAN 1992	APPENDIX D
DRAWN	SCALE	
BLANDING	NONE	SHEET 4 OF 8

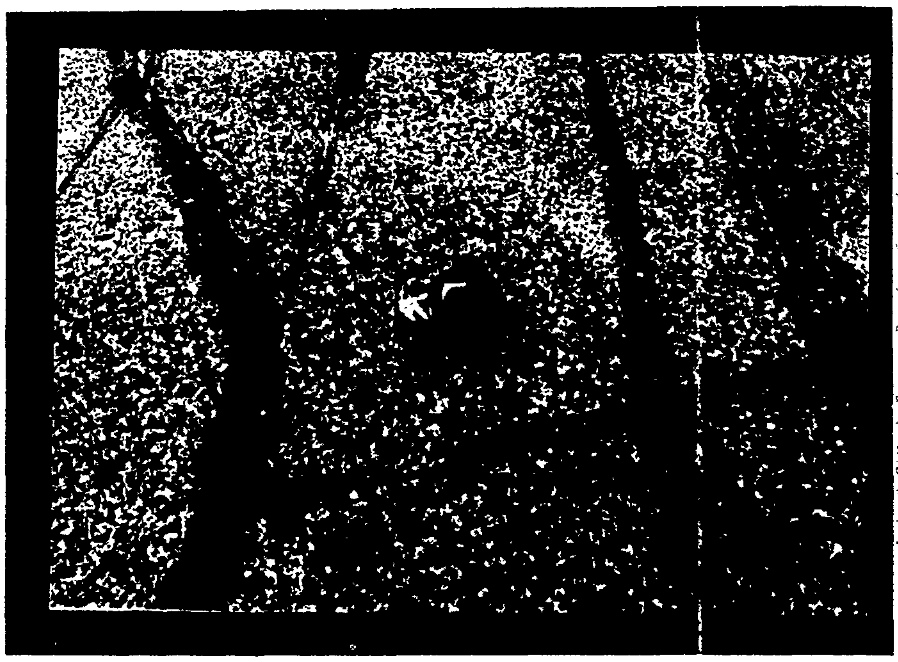


PHOTO 9 ; ERODED PCC PAVEMENT SURFACE WITH A TYPICAL LONGITUDINAL CRACK ON THE 11 END OF RUNWAY 11-29.

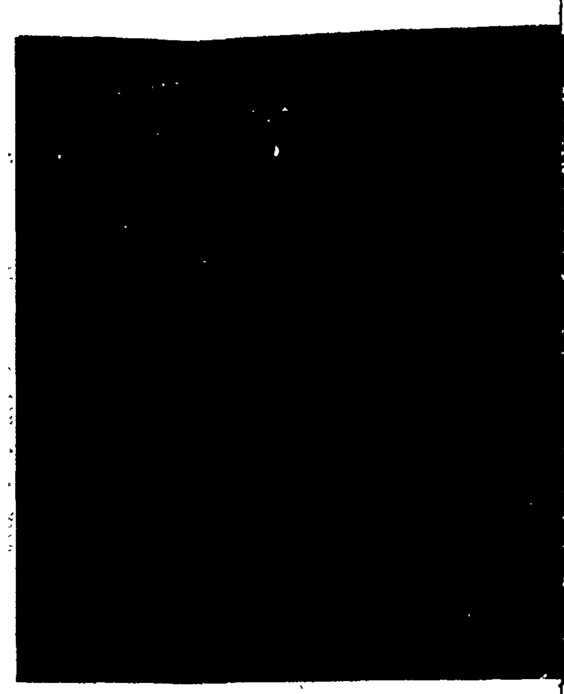


PHOTO 10 ; SHATTERED SLAB AT THE EDGE OF THE NORTHWEST

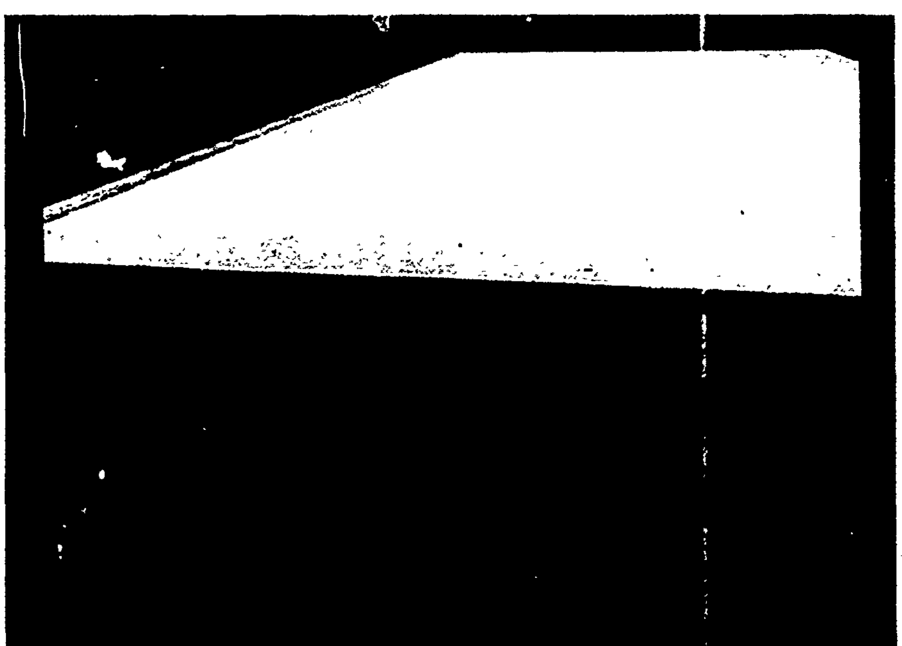


PHOTO 11 ; SMALL SECTION OF RAVELED ASPHALT PAVEMENT ON RUNWAY 11-29.

PHOTO 12 ; TYPICAL BLOCK CRACKING ON THE RUNWAY. CRAC

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4 OF 6

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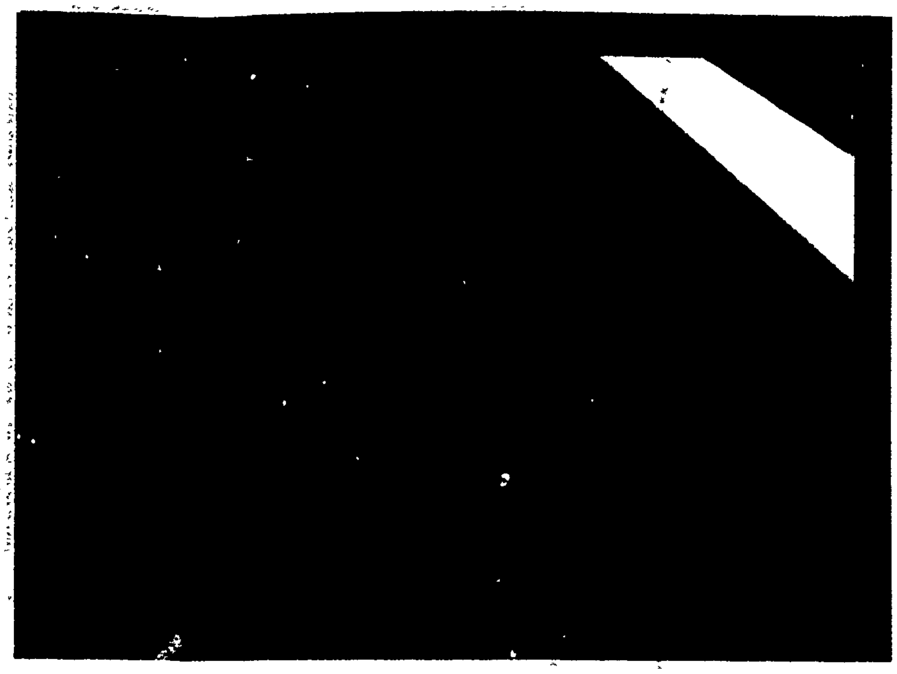

PHOTO 10: SHATTERED SLAB AT THE EDGE OF THE NORTHWEST TOUCHDOWN AREA OF RUNWAY 11-29.

E RUNWAY. CRAC

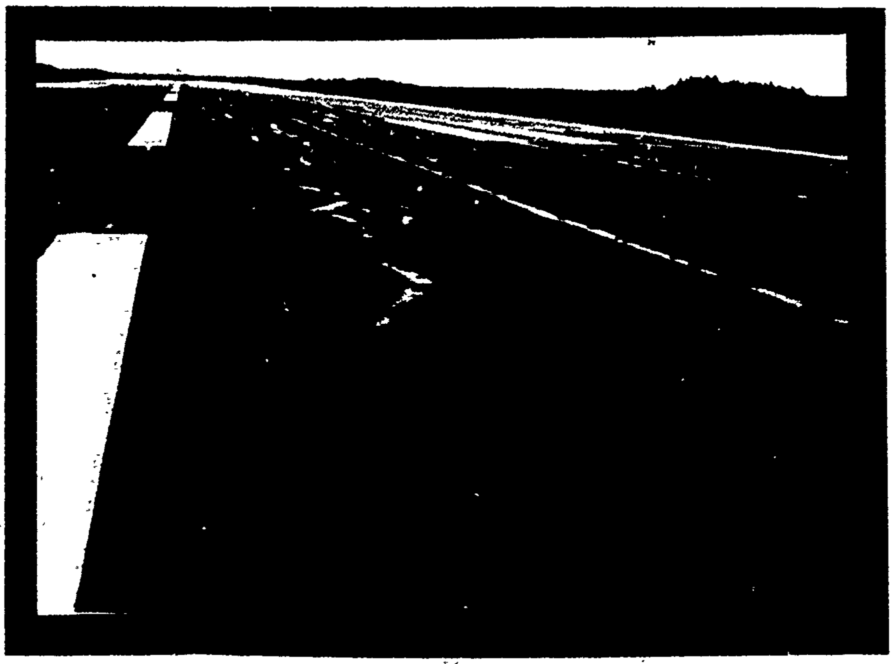

PHOTO 12: TYPICAL BLOCK CRACKING ON THE RUNWAY. CRACKS HAVE BEEN SEALED.

UNITED STATES AIR FORCE
CIVIL ENGINEERING SUPPORT AGENCY
TYNDALL AIR FORCE BASE, FLORIDA

PHOTOGRAPHS

KING SALMON AIRPORT, ALASKA

CHECKED	DATE	DRAWING NUMBER
CHRISTIANSEN	JAN 1992	APPENDIX D
DRAWN: BLANDING	SCALE: NONE	SHEET 5 OF 6

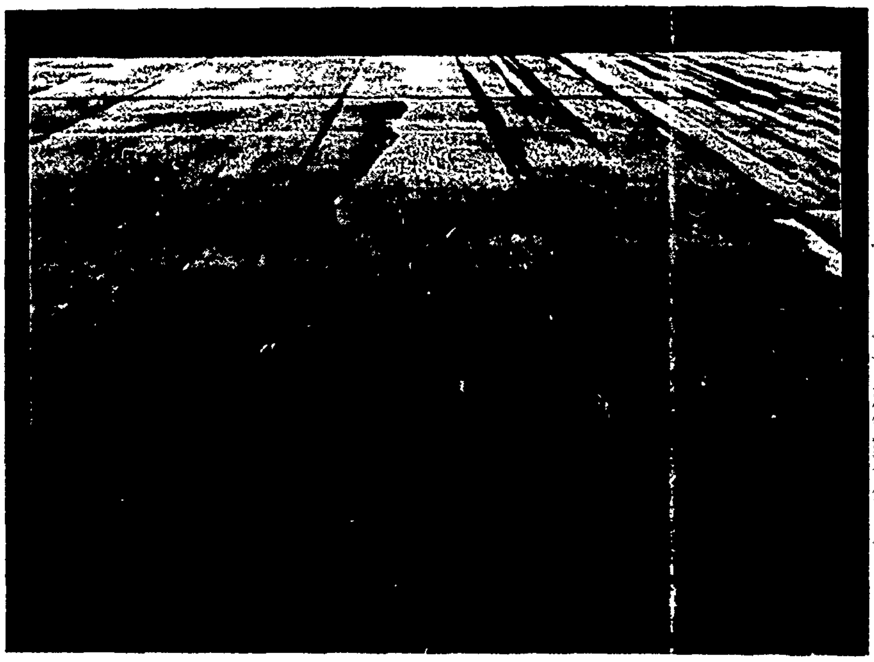

PHOTO 13 : TYPICAL LOW SEVERITY LONGITUDINAL CRACK ON THE 29 END TOUCHDOWN AREA OF RUNWAY 11-29.

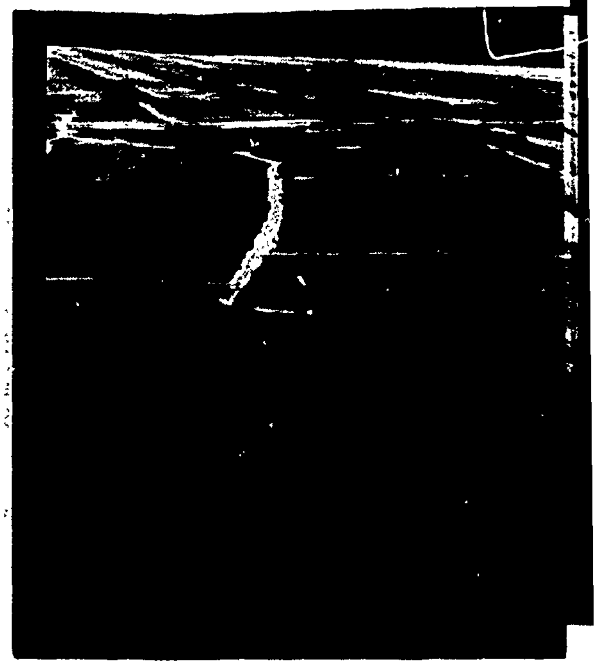

PHOTO 14 : SEALED TRANSVERSE AND LONGITUDINAL CRACKS ON

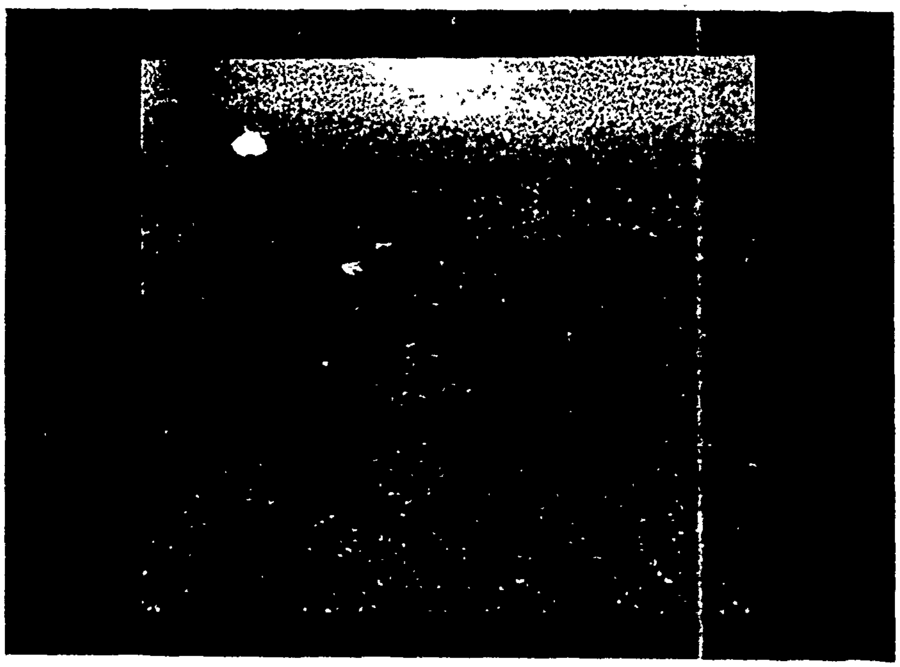

PHOTO 15 : HIGH SEVERITY TRANSVERSE CRACK ON THE EAST APRON TAXIWAY.

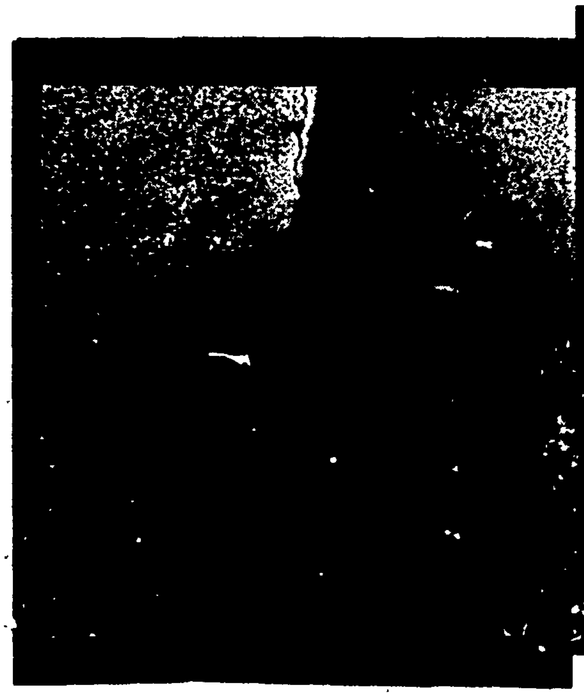

PHOTO 16 : LONGITUDINAL, TRANSVERSE, AND ALLIGATOR CRACKS

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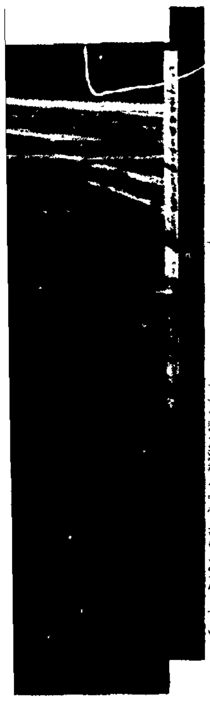
5 OF 6



JDINAL CRACKS ON

PHOTO 14 : SEALED TRANSVERSE AND LONGITUDINAL CRACKS ON THE ELEPHANT EAR APRON.

LLIGATOR CRACKS

PHOTO 16 : LONGITUDINAL, TRANSVERSE, AND ALLIGATOR CRACKS ON THE EAST APRON TAXIWAY.

UNITED STATES AIR FORCE
CIVIL ENGINEERING SUPPORT AGENCY
TYNDALL AIR FORCE BASE, FLORIDA

PHOTOGRAPHS

KING SALMON AIRPORT, ALASKA

CHRISTIANSEN	JAN 1992	APPENDIX D
BLANDING	NONE	SHEET 6 OF 6

SUMMARY OF PHYSICAL PROPERTY DATA																		
FACILITY					OVERLAY PAVEMENT			PAVEMENT			BASE			SUBBASE			SUBGRADE	
FEAT	IDENT	LGTH (ft)	WDTH (ft)	GEN COND	THICK (in)	DESCRP	1000E FLEX	THICK (in)	DESCRP	1000E FLEX	THICK (in)	DESCRP	1000E K/CBR	THICK (in)	DESCRP	1000E CBR	DESCRP	1000E K/CBR
R01A	TOUCHDWN AREA RUNWAY 11-29	600	150	FAIR				10.00	PCC	4056 / 740	6.00	* SELECT BASE	* 480		* SANDY GRAVEL (NFS)	* 480	POORLY GRADED SILTSAND (SP-SM)	38
R02A	TOUCHDWN AREA RUNWAY 11-29	400	150	VERY GOOD				5.00	AC	327	6.00	* CRUSHD AGGREGTE BASE COURSE	67	62.00	* PITRUN GRAVEL (NFS)		POORLY GRADED SILTSAND (SP/SM)	28
R03C	RUNWAY 11-29 INTERIOR (KEEL)	2200	75	VERY GOOD				4.50	AC	830	6.00	*WELL GRADED GRAVEL (GW)	43	62.00	* PITRUN GRAVEL (NFS)		POORLY GRADED SILTSAND (SP-SM)	29
R04C	RUNWAY 11-29 INTERIOR (EDGES)	2200	38	VERY GOOD				3.50	AC	254	6.00	* WELL GRADED GRAVEL (GW)	132	62.00	* PITRUN GRAVEL (NFS)		POORLY GRADED SILTSAND (SP-SM)	39
R05C	RUNWAY 11-29/ - 18/36 INTERSCN	400	75	GOOD				4.00	AC	483	6.00	* WELL GRADED GRAVEL	97	9.00	* PITRUN GRAVEL (NFS)		POORLY GRADED SILTSAND (SP-SM)	28
R06C	RUNWAY 11-29 INTRSCTN (EDGES)	400	38	GOOD				3.50	AC	261	5.00	* CRUSHD AGGREGTE BASE COURSE	95 / *90		* PITRUN GRAVEL	*60	POORLY GRADED SILTSAND (SP-SM)	38
R07C	RUNWAY 11-29 INTERIOR (KEEL)	4000	75	GOOD				4.50	AC	760	6.00	* CRUSHD AGGREGTE BASE COURSE	150 / *90		* PITRUN GRAVEL	*60	POORLY GRADED SILTSAND	18
R08C	RUNWAY 11-29 INTERIOR (EDGES)	4000	38	GOOD				4.00	AC	200	6.00	* CRUSHD AGGREGTE BASE COURSE	150 / *90		* SANDY GRAVEL	*50	UNKNOWN CLASS.	18
R09A	TOUCHDN AREA RWY 11-29 (29 END)	1000	150	VERY GOOD				8.00	PCC	6000 / 780	6.00	* CRUSHD AGGREGTE BASE COURSE	86 / *90		* SANDY GRAVEL (NFS)	*50	POORLY GRADED SILTSAND (SP-SM)	41
R10A	RUNWAY 18-36	5000	100	EXCEL				3.00	AC	596	*12.5	* CRUSHD AGGREGTE BASE COURSE	106				POORLY GRADED SILTSAND (SP-SM)	29
O01A	RUNWAY 18 END	250	250	POOR				.25	AC	358	9.00	SAND ASPHALT	232				POORLY GRADED SANDSILT (SP-SM)	38
T01A	TAXIWAY 1	800	75	GOOD	1.50	AC	553	3.50	AC	553	6.00	* CRUSHD AGGREGTE BASE COURSE	11 / *90	8.00	* SANDY GRAVEL (NFS)		POORLY GRADED SILTSAND (SP-SM)	14
T02A	TAXIWAY 2	300	200	VERY GOOD	1.50	AC (WIDTH VARIES)	618	3.50	AC	618	6.00	* CRUSHD AGGREGTE BASE COURSE	39	8.00	* SANDY GRAVEL		POORLY GRADED SILTSAND (SP-SM)	13

*Denotes data taken from report archives

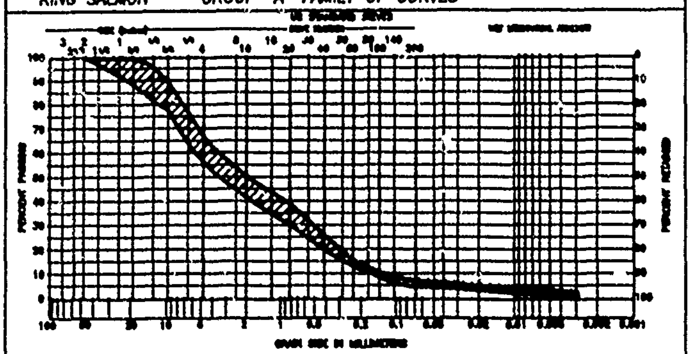
FACILITY					OVERLAY PAVEMENT			PAVEMENT			BASE			SUBBASE			SUBGRADE	
FEAT	IDENT	LGTH (ft)	WDTH (ft)	GEN COND	THICK (in)	DESCRP	1000E FLEX	THICK (in)	DESCRP	1000E FLEX	THICK (in)	DESCRP	1000E K/CBR	THICK (in)	DESCRP	1000E CBR	DESCRP	1000E K/CBR
T03A	TAXIWAY 3	1470	75	VERY GOOD	1.50	AC	734	3.50	AC	734	6.00	* CRUSHD AGGREGTE BASE COURSE	63	8.00	* SANDY GRAVEL		POORLY GRADED SILTSAND (SP-SM)	15
T04A	TAXIWAY 4	600	75	FAIR	4.50	AC	370	3.00	AC	370	6.00	* CRUSHD AGGREGTE BASE COURSE	150 *75	11.00	* SAND (NFS)	*20	POORLY GRADED SILTSAND (SP-SM)	17
T05A	TAXIWAY 4	1450	75	FAIR	2.00	AC	200	3.00	AC	200	UNK	UNKNOWN CLASS.	64	UNK	UNKNOWN CLASS.		POORLY GRADED SILTSAND (SP-SM)	12
T06A	TAXIWAY 'C'	1050	75	VERY GOOD				4.00	AC	309	11.00		59				POORLY GRADED SILTSAND ()SP-SM)	15
T07A	TAXIWAY 'E'	1800	100	POOR				3.00	AC	659	6.00		45				POORLY GRADED SILTSAND (SP-SM)	15
A01B	ALERT HANGAR ACCESS APRONS	420	100	VERY GOOD				10.00	PCC (LENGTH VARIES)	5112 740							POORLY GRADED SILTSAND (SP-SM)	21
A02B	ALERT HANGAR ACCESS APRON	240	150	EXCEL				12.00	PCC (WIDTH VARIES)	5526 600							POORLY GRADED SILTSAND (SP-SM)	32
A03B	ALERT AREA EDGE APRON	800	75	VERY GOOD				5.00	AC (WIDTH & LENGTH VARIES)	288	6.00		98				POORLY GRADED SILTSAND (SP-SM)	14
A04B	TRANSIT ALERT RAMP (USAF)	406	200	FAIR				4.50	AC	200	6.00	* CRUSHD AGGREGTE BASE COURSE	127 *75	11.00	* SAND (NFS)	*20	POORLY GRADED SILTSAND (SP-SM)	12
A05B	TRANSIT ALERT RAMP CORNER	150	152	GOOD				10.00	PCC	5098 600	4.00	* SANDY GRAVEL FILTER COURSE	*300				POORLY GRADED SILTSAND (SP-SM)	19
A06B	ELEPHANT EAR RAMP (HAMMER-HEAD)	450	150	GOOD				4.00	AC (WIDTH VARIES)	257	6.00		48				POORLY GRADED SILTSAND (SP-SM)	13

*Denotes data taken from report archives

C-2 | CHRISTIANSEN | MESS'NA | JAN 1992 | NONE | APPENDIX C | SHEET 2 OF 2

GRAIN SIZE DISTRIBUTION GRAPH – AGGREGRATE GRADING CHART

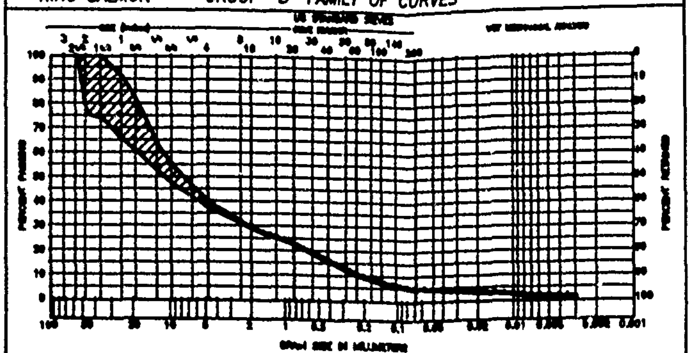
KING SALMON GROUP "A" FAMILY OF CURVES



CORE HOLE	LAYER	DEPTH	Gs	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	FROST GROUP	U.S.C.S. CLASS.	MUNSELL COLOR DESIGNATION
4	BC	8	2.80	NP	NP	NP	S2	SP–SM	2.5Y 5/3 LT. BROWNISH GREY
13	BC	4	2.773	NP	NP	NP	S2	SP–SM	2.5Y 6/3 LT. YELLOWISH BROWN
26	BC	4.25	2.796	NP	NP	NP	S2	SP–SM	10YR 5/2 GREYISH BROWN

GRAIN SIZE DISTRIBUTION GRAPH – AGGREGRATE GRADING CHART

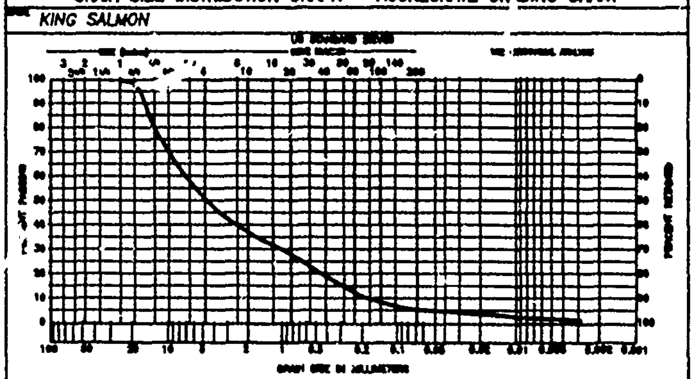
KING SALMON GROUP "B" FAMILY OF CURVES



CORE HOLE	LAYER	DEPTH	Gs	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	FROST GROUP	U.S.C.S. CLASS.	MUNSELL COLOR DESIGNATION
1	SB	10.5	2.784	NP	NP	NP	S1	GW–GM	2.5Y 5/3 LIGHT OLIVE BROWN
8	SB	9	2.778	NP	NP	NP	S1	GW–GM	2.5Y 6/3 LT. YELLOWISH BRCWN

GRAIN SIZE DISTRIBUTION GRAPH – AGGREGRATE GRADING CHART

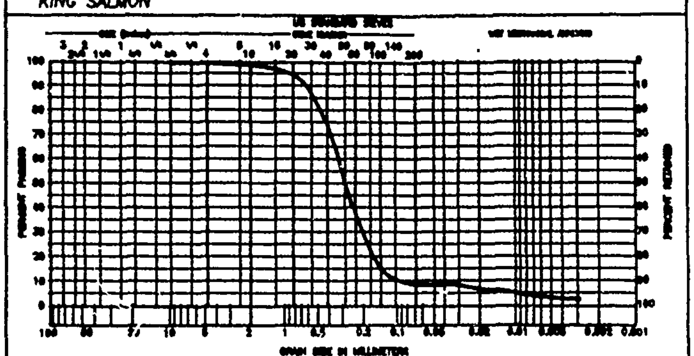
KING SALMON



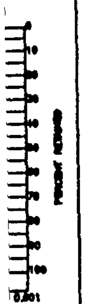
CORE HOLE	LAYER	DEPTH	Gs	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	FROST GROUP	U.S.C.S. CLASS.	MUNSELL COLOR DESIGNATION
1	BC	4.5	2.818	NP	NP	NP	S1	GP–GM	2.5Y 5/3 LIGHT OLIVE BROWN

GRAIN SIZE DISTRIBUTION GRAPH – AGGREGRATE GRADING CHART

KING SALMON



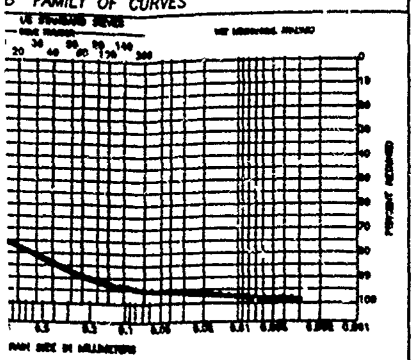
CORE HOLE	LAYER	DEPTH	Gs	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	FROST GROUP	U.S.C.S. CLASS.	MUNSELL COLOR DESIGNATION
20	SG		2.738	NP	NP	[illegible]	F2	SP–SM	10YR 5/6 LIGHT BROWNISH GREY



ROWN
BRCWN

GRAPH – AGGREGATE GRADING CHART

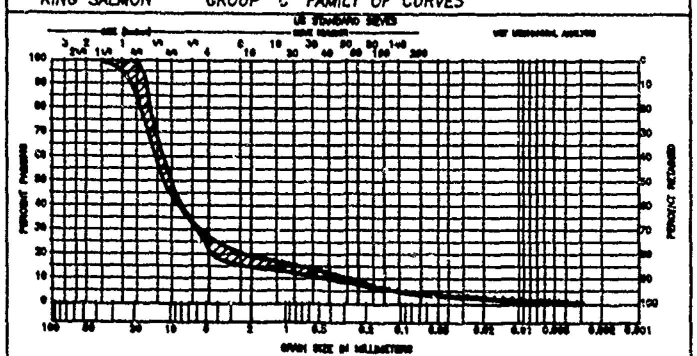
B" FAMILY OF CURVES



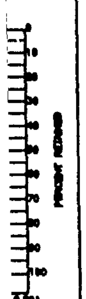
PLASTIC INDEX	FROST GROUP	U.S.C.S. CLASS.	MUNSELL COLOR DESIGNATION
NP	S1	GW-GM	2.5Y 5/3 LIGHT OLIVE BROWN
NP	S1	GW-GM	2.5Y 6/3 LT. YELLOWISH BROWN

GRAIN SIZE DISTRIBUTION GRAPH – AGGREGATE GRADING CHART

KING SALMON GROUP "C" FAMILY OF CURVES

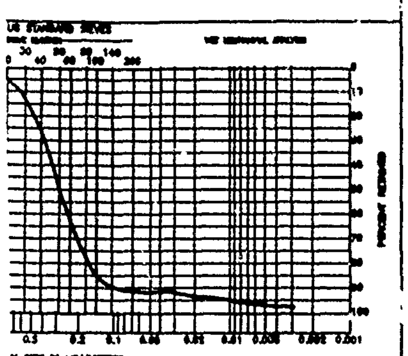


CORE HOLE	LAYER	DEPTH	Gs	LIQUID LIMIT	PLASTIC LIMIT	PLASTIC INDEX	FROST GROUP	U.S.C.S. CLASS.	MUNSELL COLOR DESIGNATION
8	BC	4.75	2.787	NP	NP	NP	S1	GP	2.5Y 6/3 LT. YELLOWISH BROWN
20	BC	4.75	2.736	NP	NP	NP	PFS	GP	2.5Y 6/2 LT. BROWNISH GREY



SH GREY

GRAPH – AGGREGATE GRADING CHART



PLASTIC INDEX	FROST GROUP	U.S.C.S. CLASS.	MUNSELL COLOR DESIGNATION
NP	F2	SP-SM	10YR 5/6 LIGHT BROWNISH GREY

LEGEND

S1
S2
F1 } SOIL FROST GROUPS WITH F4 BEING MOST FROST SUSCEPTABLE
F2
F3
F4

Gs SPECIFIC GRAVITY
NP NON PLASTIC
BC BASE COURSE
SB SUBBASE
SG SUBGRADE

UNIFIED SOIL CLASSIFICATION

GM SILTY GRAVEL
GP-GM POORLY GRADED SILTY GRAVEL
SM SILTY SAND
SP-SM POORLY GRADED SILTY SAND

UNITED STATES AIR FORCE
CIVIL ENGINEERING SUPPORT AGENCY
TYNDALL AIR FORCE BASE, FLORIDA

LABORATORY TEST RESULTS

KING SALMON AIRPORT, ALASKA

ENGINEER	DATE	DRAWING NUMBER
CHRISTIANSEN	JAN 1992	APPENDIX E
DRAWN LEE	SCALE NONE	SHEET 2 OF 5

SUMMARY OF ALLOWABLE GROSS LOADS IN BRITISH UNITS

FEAT.	PASS INTENSITY LEVEL	PAVEMENT CAPACITY IN KIPS FOR AIRCRAFT GROUP INDEX NUMBERS												
		1	2	3	4	5	6	7	8	9	10	11	12	13
R01A	I	+	66	75	+	120	+	142	303	285	837	519	747	275
	II	+	77	87	+	+	+	158	337	317	+	+	+	320
	III	+	+	97	+	+	+	185	395	372	+	+	+	390
	IV	+	+	+	+	+	+	+	+	463	+	+	+	486
R02A	I	+	44	56	152	109	114	127	248	242	818	372	551	252
	II	+	50	62	161	116	121	135	263	257	+	403	597	273
	III	+	53	65	+	+	+	146	285	278	+	490	726	332
	IV	+	58	71	+	+	+	178	347	339	+	+	+	414
R03C	I	+	50	78	+	+	+	198	335	328	+	+	+	394
	II	+	72	100	+	+	+	+	+	418	+	+	+	438
	III	+	+	106	+	+	+	+	+	453	+	+	+	+
	IV	+	+	+	+	+	+	+	+	+	+	+	+	+
R04C	I	+	64	88	+	+	+	195	376	366	+	576	834	389
	II	+	69	95	+	+	+	205	395	384	+	+	+	415
	III	+	73	99	+	+	+	+	+	411	+	+	+	+
	IV	+	78	106	+	+	+	+	+	+	+	+	+	+
R05C	I	+	70	90	+	+	+	199	391	380	+	587	+	394
	II	+	+	98	+	+	+	+	+	403	+	+	+	427
	III	+	+	104	+	+	+	+	+	437	+	+	+	+
	IV	+	+	113	+	+	+	+	+	+	+	+	+	+
R06C	I	+	50	72	+	+	+	161	307	299	+	478	685	322
	II	+	54	78	+	+	+	169	323	314	+	511	733	344
	III	+	57	82	+	+	+	181	346	336	+	+	+	413
	IV	+	61	87	+	+	+	+	+	403	+	+	+	+
R07C	I	+	62	73	+	+	+	162	318	307	+	496	733	327
	II	+	70	82	+	+	+	174	344	331	+	549	812	362
	III	+	75	88	+	+	+	193	381	367	+	+	+	449
	IV	+	+	98	+	+	+	+	+	455	+	+	+	+
R08C	I	+	54	66	+	+	+	147	289	278	+	450	662	298
	II	+	61	73	+	+	+	159	311	301	+	498	734	330
	III	+	66	79	+	+	+	176	345	333	+	+	+	409
	IV	+	73	88	+	+	+	+	+	413	+	+	+	+
R09A	I	+	46	55	142	89	96	107	230	218	643	392	567	208
	II	+	54	64	159	99	106	118	256	243	710	461	667	242
	III	+	60	71	+	117	+	139	300	285	825	573	830	296
	IV	+	72	85	+	+	+	173	372	354	+	+	+	369
R10A	I	+	38	50	142	96	100	114	220	214	743	337	492	227
	II	+	42	55	150	102	106	121	233	227	788	364	532	246
	III	+	44	58	163	110	115	130	253	246	+	443	646	299
	IV	+	48	63	+	+	+	159	307	299	+	553	807	373

SEE APPENDIX G FOR RELATED DATA.

SUMMARY OF ALLOWABLE GROSS LOADS IN BRITISH UNITS

FEAT.	PASS INTENSITY LEVEL	PAVEMENT CAPACITY IN KIPS FOR AIRCRAFT GROUP INDEX NUMBERS												
		1	2	3	4	5	6	7	8	9	10	11	12	13
	I	+	42	51	155	105	110	126	243	237	701	372	541	250
001A	II	+	45	61	167	110	115	132	256	249	+	398	579	268
25%R	III	+	48	64	+	118	123	142	274	266	+	477	694	321
	IV	+	51	69	+	+	+	170	328	319	+	+	+	401
	I	+	24	A	103	65	70	A	142	A	409	272	408	A
T01A	II	+	35	A	112	83	89	99	181	180	520	307	465	206
	III	+	44	49	126	96	102	111	221	215	703	384	582	258
	IV	+	50	55	158	120	+	139	277	270	+	479	727	322
	I	+	30	A	93	68	72	A	158	153	506	244	366	A
T02A	II	+	35	A	102	75	80	A	173	168	555	276	414	184
	III	+	38	A	115	85	90	98	196	189	627	347	520	231
	IV	+	43	49	144	106	113	124	246	238	787	433	649	288
	I	+	37	A	114	83	88	97	193	186	618	298	445	197
T03A	II	+	43	49	124	91	96	106	210	202	672	334	499	221
	III	+	47	53	139	102	108	118	235	227	753	417	623	276
	IV	+	52	60	174	+	+	148	293	283	+	521	778	345
	I	+	61	68	+	+	+	147	289	275	+	458	673	299
T04A	II	+	68	77	+	+	+	159	312	297	+	509	749	332
	III	+	74	83	+	+	+	177	347	331	+	+	+	413
	IV	+	+	93	+	+	+	+	+	411	+	+	+	+
	I	23	21	A	72	51	A	A	118	A	388	A	A	A
T05A	II	+	24	A	80	56	A	A	130	A	427	A	A	A
	III	+	27	A	91	64	67	A	148	A	485	266	394	A
	IV	+	30	A	114	81	85	95	186	180	611	332	492	222
	I	+	29	A	92	67	70	A	153	A	499	A	351	A
T06A	II	+	32	A	101	73	77	A	167	162	543	265	393	A
	III	+	35	A	113	82	86	95	187	181	608	331	491	221
	IV	+	40	A	141	102	107	118	233	226	759	413	613	277
	I	17	15	A	A	38	A	A	87	A	A	A	A	A
T07A	II	19	17	A	A	41	A	A	94	A	A	A	A	A
25%R	III	21	19	A	A	46	A	A	106	A	351	A	A	A
	IV	23	21	A	82	58	61	A	132	A	438	A	346	A
	I	+	60	68	158	105	111	121	244	227	643	422	596	221
A01B	II	+	70	79	+	117	124	135	273	254	712	500	707	258
	III	+	79	89	+	+	+	160	324	301	831	+	+	316
	IV	+	+	106	+	+	+	203	+	381	+	+	+	397
	I	+	67	74	169	114	121	130	260	241	677	447	633	237
A02B	II	+	79	86	+	+	+	146	290	270	750	530	750	276
	III	+	+	97	+	+	+	173	345	320	+	+	+	338
	IV	+	+	+	+	+	+	+	+	405	+	+	+	424

SEE APPENDIX G FOR RELATED DATA.

SUMMARY OF ALLOWABLE GROSS LOADS IN BRITISH UNITS														
FEAT.	PASS INTENSITY LEVEL	PAVEMENT CAPACITY IN KIPS FOR AIRCRAFT GROUP INDEX NUMBERS												
		1	2	3	4	5	6	7	8	9	10	11	12	13
A03B	I	+	25	A	81	57	A	A	129	A	411	A	A	A
	II	+	29	A	88	62	66	A	141	A	449	A	338	A
	III	+	32	A	99	70	74	A	158	152	505	288	424	192
	IV	+	36	A	124	88	93	103	198	190	633	360	529	240
A04B	I	+	24	A	85	59	62	A	136	A	448	A	A	A
	II	+	28	A	93	64	68	A	150	A	493	248	364	A
	III	+	31	A	106	73	78	A	171	165	560	312	458	206
	IV	+	35	A	134	92	98	109	215	207	705	389	572	257
A05B	I	+	50	56	130	86	92	100	199	185	522	344	486	182
	II	+	59	66	146	97	103	111	223	206	578	408	576	212
	III	+	66	74	174	115	122	132	264	245	674	513	725	260
	IV	+	80	89	+	+	+	167	334	310	828	+	+	326
A06B	I	20	18	A	A	46	A	A	105	A	349	A	A	A
	II	23	21	A	71	50	A	A	115	A	382	A	A	A
	III	+	23	A	81	57	A	A	130	A	432	A	344	A
	IV	+	26	A	101	71	75	A	164	159	543	291	429	196

SEE APPENDIX G FOR RELATED DATA.

NOTES

IN REFERENCE TO THE ALLOWABLE GROSS LOAD (AGL) TABLE:

A *Denotes lowest possible empty gross weight of any aircraft within the group exceeds the AGL of the pavement. Pavement cannot support aircraft for respective pass intensity level.*

+ *Denotes no weight restrictions. AGL of the pavement exceeds the greatest possible gross weight of any aircraft in the group.*

The load carrying capacities of the pavements reported herein are based on material properties representative of the in-place conditions at the time this field investigation was conducted.

FROST-MELT PERIOD

SUMMARY OF ALLOWABLE GROSS LOADS IN BRITISH UNITS

FEAT.	PASS INTENSITY LEVEL	PAVEMENT CAPACITY IN KIPS FOR AIRCRAFT GROUP INDEX NUMBERS												
		1	2	3	4	5	6	7	8	9	10	11	12	13
001A	I	+	32	A	119	80	84	96	187	181	625	292	428	195
	II	+	36	A	128	86	91	103	201	195	674	323	472	215
	III	+	39	51	141	95	100	114	223	216	744	399	584	267
	IV	+	43	56	+	118	124	141	275	267	+	499	730	333
T01A	I	20	19	A	A	42	A	A	99	A	A	A	A	A
	II	+	23	A	A	48	A	A	113	A	357	A	A	A
	III	+	27	A	78	58	62	A	135	A	424	245	368	A
	IV	+	32	A	99	73	79	A	172	165	541	306	460	200
T02A	I	20	19	A	A	42	A	A	97	A	A	A	A	A
	II	24	23	A	A	48	A	A	110	A	350	A	A	A
	III	+	26	A	78	57	61	A	131	A	417	242	360	A
	IV	+	31	A	99	72	77	A	168	161	532	302	450	197
T03A	I	+	23	A	71	51	A	A	119	A	377	A	A	A
	II	+	28	A	80	58	62	A	134	A	426	A	340	A
	III	+	32	A	94	68	73	A	158	151	500	292	433	190
	IV	+	37	A	120	87	93	101	201	192	636	365	540	237
T04A	I	+	39	A	112	80	85	93	179	168	560	301	437	195
	II	+	46	51	126	89	95	104	200	188	627	350	508	227
	III	+	51	57	146	104	111	121	233	219	729	444	645	288
	IV	+	60	66	+	+	+	153	296	278	+	555	805	359
T05A	I	12	11	A	A	28	A	A	65	A	A	A	A	A
	II	15	14	A	A	32	A	A	75	A	A	A	A	A
	III	17	16	A	A	39	A	A	91	A	A	A	A	A
	IV	21	19	A	70	50	A	A	116	A	376	A	A	A
T06A	I	18	17	A	A	40	A	A	91	A	A	A	A	A
	II	22	20	A	A	45	A	A	103	A	332	A	A	A
	III	+	23	A	73	53	A	A	121	A	390	A	A	A
	IV	+	27	A	93	67	71	A	154	A	497	276	410	183
T07A 25%R	I	10	9	A	A	22	A	A	A	A	A	A	A	A
	II	12	11	A	A	25	A	A	A	A	A	A	A	A
	III	13	12	A	A	30	A	A	69	A	A	A	A	A
	IV	15	14	A	A	38	A	A	88	A	A	A	A	A
A01B	I	+	55	61	134	91	97	104	199	184	513	344	484	186
	II	+	64	71	150	102	108	116	222	206	568	407	574	216
	III	+	72	79	+	+	+	138	264	245	662	512	723	265
	IV	+	+	95	+	+	+	175	333	309	814	+	+	333
A02B	I	+	61	66	142	98	104	111	208	193	531	358	506	196
	II	+	71	77	159	110	117	125	233	216	588	424	600	229
	III	+	+	86	+	+	+	148	276	257	686	534	756	280
	IV	+	+	103	+	+	+	187	349	325	+	+	+	352

SEE APPENDIX G FOR RELATED DATA.

FROST-MELT PERIOD

SUMMARY OF ALLOWABLE GROSS LOADS IN BRITISH UNITS

FEAT.	PASS INTENSITY LEVEL	PAVEMENT CAPACITY IN KIPS FOR AIRCRAFT GROUP INDEX NUMBERS												
		1	2	3	4	5	6	7	8	9	10	11	12	13
R01A	I	+	59	66	154	102	109	118	242	225	657	420	598	225
	II	+	69	76	172	113	121	131	268	250	725	493	704	262
	III	+	77	85	+	+	+	154	315	293	+	+	+	320
	IV	+	+	100	+	+	+	192	391	365	+	+	+	398
R02A	I	+	31	A	95	70	74	A	161	156	518	248	371	A
	II	+	35	A	104	76	81	A	175	170	565	279	417	186
	III	+	38	A	117	86	91	100	197	191	636	349	522	233
	IV	+	43	50	146	107	114	125	247	240	796	436	652	291
R03C	I	+	43	52	139	103	110	120	239	232	734	364	547	244
	II	+	53	60	151	113	120	131	260	252	831	407	613	273
	III	+	57	65	169	+	+	147	291	283	+	509	765	341
	IV	+	64	73	+	+	+	183	363	353	+	+	+	426
R04C	I	+	43	54	152	105	110	124	242	236	806	374	550	251
	II	+	48	61	163	113	118	133	261	253	+	412	606	276
	III	+	52	65	+	+	+	147	287	279	+	509	748	341
	IV	+	57	72	+	+	+	182	355	344	+	+	+	426
R05C	I	+	51	57	152	110	117	128	253	243	810	397	589	262
	II	+	58	65	166	+	+	140	276	266	+	446	662	294
	III	+	63	71	+	+	+	157	311	299	+	559	829	368
	IV	+	71	80	+	+	+	197	389	374	+	+	+	460
R06C	I	+	28	A	112	74	77	A	172	167	585	269	390	181
	II	+	32	A	121	80	83	96	185	180	630	297	431	200
	III	+	34	A	134	89	92	106	204	199	696	368	534	248
	IV	+	38	51	166	110	114	131	253	246	+	459	667	310
R07C	I	+	39	A	121	86	91	100	196	186	624	325	476	211
	II	+	47	53	136	96	102	112	220	209	698	378	554	245
	III	+	52	59	158	112	119	131	256	243	812	480	703	311
	IV	+	61	69	+	+	+	166	325	308	+	+	+	389
R08C	I	+	34	A	111	78	82	A	178	169	570	293	429	191
	II	+	41	A	124	87	92	102	199	190	638	341	499	222
	III	+	46	53	144	101	107	118	231	220	742	433	633	282
	IV	+	53	62	+	+	+	150	294	280	+	540	791	353
R09A	I	+	42	A	118	76	81	A	187	175	514	324	463	A
	II	+	48	56	131	84	90	99	208	194	568	381	545	200
	III	+	54	62	155	99	106	117	244	228	660	473	678	244
	IV	+	65	74	+	+	+	145	303	284	805	+	+	305
R10A	I	+	23	A	81	56	A	A	130	A	432	A	A	A
	II	+	26	A	88	61	64	A	141	A	470	A	334	A
	III	+	28	A	99	69	72	A	158	154	526	284	418	191
	IV	+	31	A	124	86	90	101	198	192	657	354	522	238

SEE APPENDIX G FOR RELATED DATA.

FROST-MELT PERIOD

SUMMARY OF ALLOWABLE GROSS LOADS IN BRITISH UNITS														
FEAT.	PASS INTENSITY LEVEL	PAVEMENT CAPACITY IN KIPS FOR AIRCRAFT GROUP INDEX NUMBERS												
		1	2	3	4	5	6	7	8	9	10	11	12	13
A03B	I	18	17	A	A	39	A	A	91	A	A	A	A	A
	II	22	20	A	A	45	A	A	104	A	334	A	A	A
	III	+	23	A	76	53	A	A	124	A	398	A	339	A
	IV	+	28	A	97	68	72	A	158	151	508	287	423	188
A04B	I	15	14	A	A	34	A	A	80	A	A	A	A	A
	II	19	17	A	A	40	A	A	92	A	A	A	A	A
	III	22	20	A	69	48	A	A	111	A	359	A	A	A
	IV	+	25	A	88	61	65	A	142	A	459	261	383	A
A05B	I	+	45	50	109	75	79	A	160	A	410	276	390	A
	II	+	53	58	123	84	89	95	179	166	454	327	462	A
	III	+	60	66	146	100	106	113	212	197	529	412	581	216
	IV	+	73	79	+	+	+	143	268	249	650	537	758	271
A06B	I	12	11	A	A	27	A	A	63	A	A	A	A	A
	II	14	13	A	A	31	A	A	72	A	A	A	A	A
	III	16	15	A	A	37	A	A	86	A	A	A	A	A
	IV	19	18	A	A	47	A	A	109	A	358	A	A	A

SEE APPENDIX G FOR RELATED DATA.

NOTES

IN REFERENCE TO THE ALLOWABLE GROSS LOAD (AGL) TABLE:

- ***A*** *Denotes lowest possible empty gross weight of any aircraft within the group exceeds the AGL of the pavement. Pavement cannot support aircraft for respective pass intensity level.*

- ***+*** *Denotes no weight restrictions. AGL of the pavement exceeds the greatest possible gross weight of any aircraft in the group.*

The load carrying capacities of the pavements reported herein are based on material properties representative of the in-place conditions at the time this field investigation was conducted.

PAVEMENT CLASSIFICATION NUMBERS (PCNs)*

Feature	PCN
R1A	46/R/B/W/T
R2A	37/F/B/W/T
R3C	56/F/B/W/T
R4C	64/F/B/W/T
R5C	69/F/B/W/T
R6C	49/F/B/W/T
R7C	51/F/B/W/T
R8C	46/F/B/W/T
R9A	28/R/B/W/T
R10A	30/F/B/W/T
O1A	34/F/B/W/T

Feature	PCN
T1A	14/F/B/W/T
T2A	16/F/B/W/T
T3A	25/F/B/W/T
T4A	44/F/B/W/T
T5A	10/F/B/W/T
T6A	16/F/B/W/T
T7A	5/F/B/W/T

Feature	PCN
A1B	31/R/B/W/T
A2B	36/R/B/W/T
A3B	10/F/B/W/T
A4B	12/F/B/W/T
A5B	21/R/B/W/T
A6B	9/F/B/W/T

*BASED ON GROUP 9 AIRCRAFT, 50,000 PASSES.

A brief explanation on the PCN code is shown below for PCN = 31/F/A/W/T.

PCN FIVE-PART CODE

PCN /	Pavement Type /	Subgrade Strength /	Allowable Tire Pressure /	Method of PCN Determination
Numeric Value	F - Flexible	A	W	T - Technical Evaluation
		B	X	
31	R - Rigid	C	Y	U - Using Aircraft
		D	Z	

EXPLANATION OF TERMS:

Subgrade Strength Codes

Code	Category	Flexible Pavement CBR, %	Rigid Pavement k, pci
A	High	Over 13	Over 400
B	Medium	9 - 13	201-400
C	Low	4 - 8	100-200
D	Ultralow	< 4	< 100

Tire Pressure Codes

Code	Category	Allowable Tire Pressure, psi
W	High	No Limit
X	Medium	146 - 217
Y	Low	74 - 145
Z	Ultralow	0 - 73

RIGID PAVEMENT (ALL SUBGRADES)

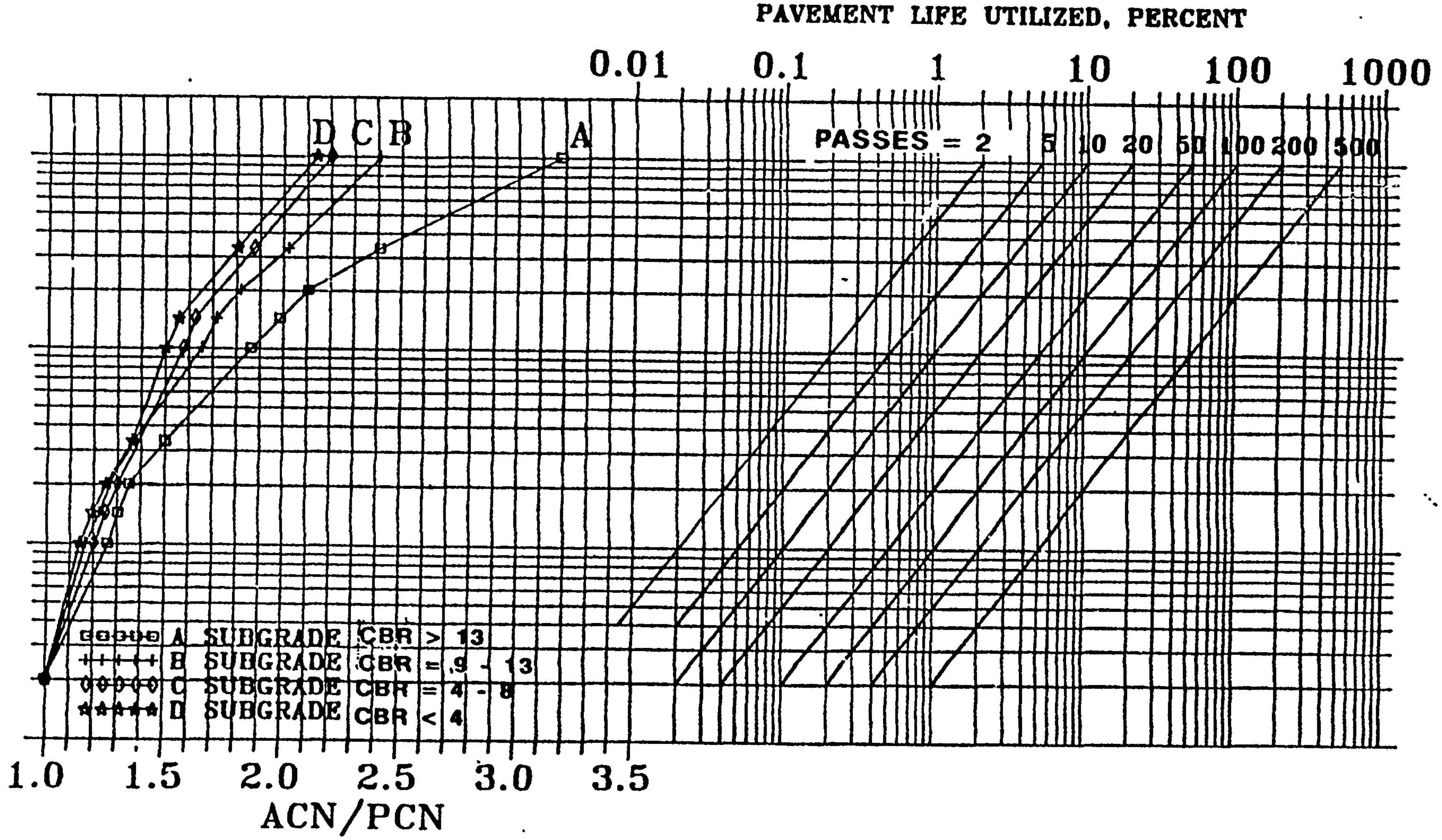


CHART 1

FLEXIBLE PAVEMENT (A,B,C,D SUBGRADES)

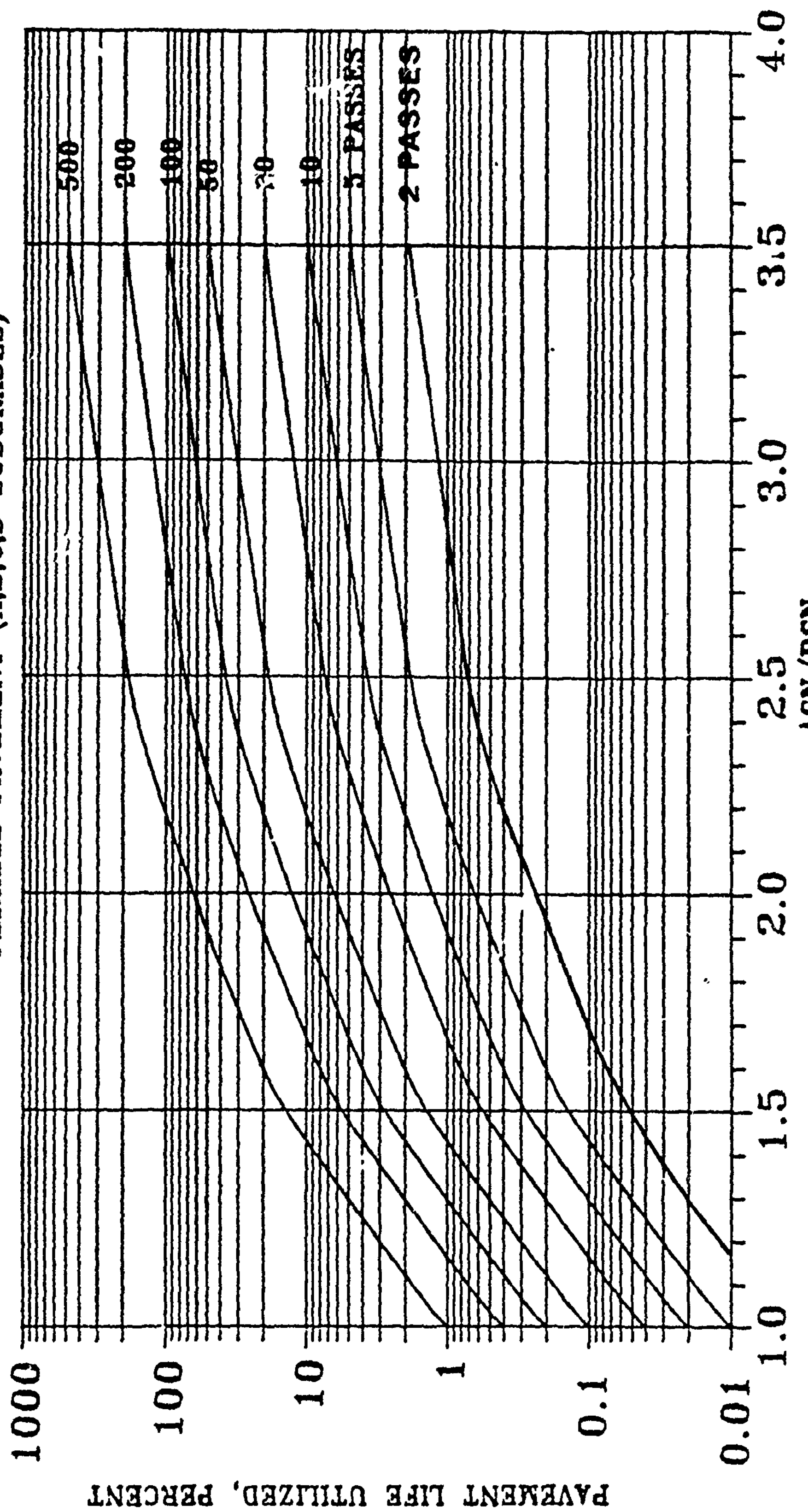


CHART 2

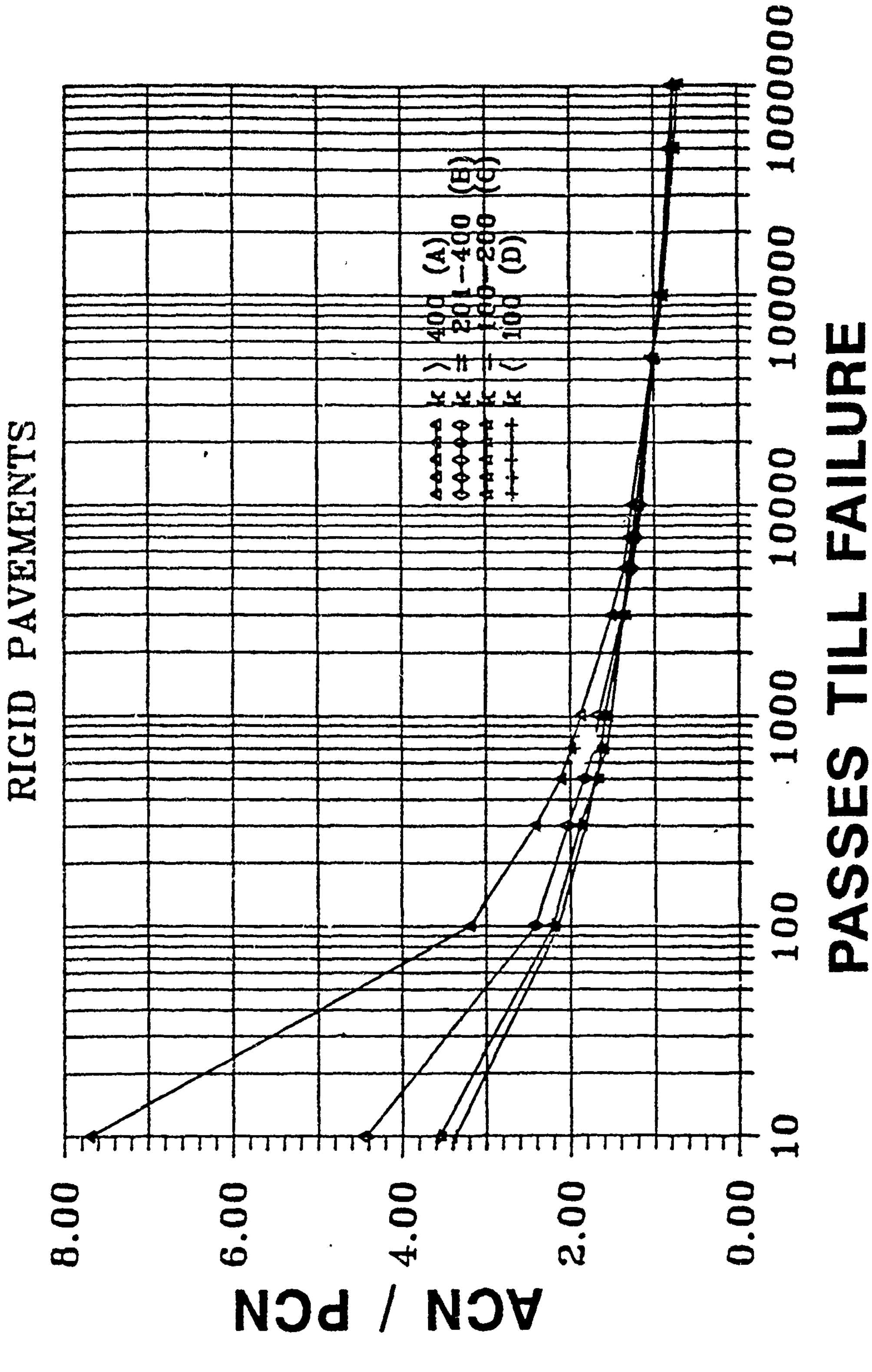

RIGID PAVEMENTS
k > 400 (A)
k = 201-400 (B)
k = 100-200 (C)
k < 100 (D)
ACN / PCN
8.00
6.00
4.00
2.00
0.00
10
100
1000
10000
100000
1000000
PASSES TILL FAILURE

CHART 3

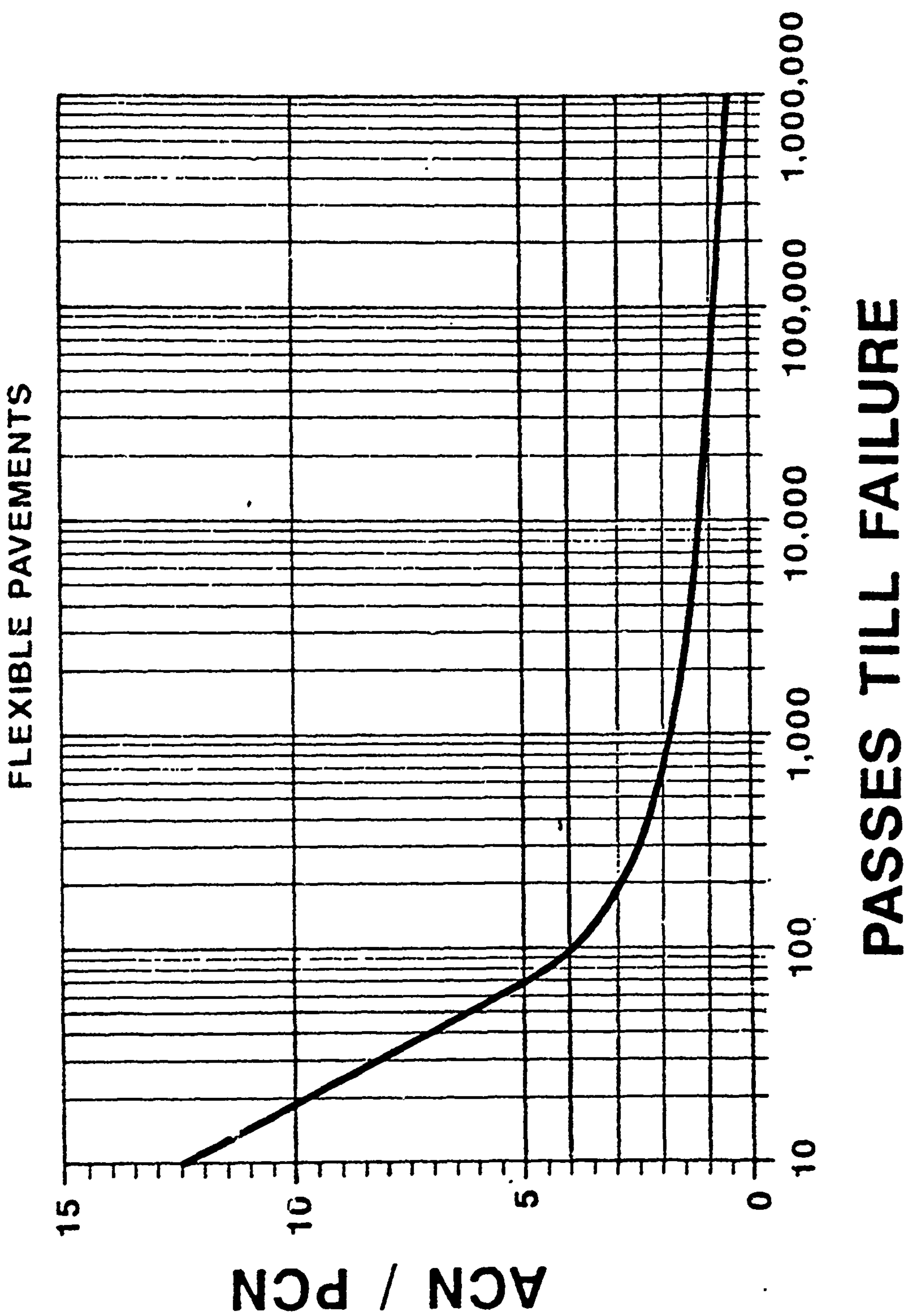

FLEXIBLE PAVEMENTS
ACN / PCN
15
10
5
0
10
100
1,000
10,000
100,000
1,000,000
PASSES TILL FAILURE

CHART 4

AIRCRAFT GROUP INDEX

LIGHT LOAD			MEDIUM LOAD							HEAVY LOAD		
1	2	3	4	5	6	7	8	9	10	11	12	13
A-37	A-7	*F-111	C-130	C-7	737	*727	707	C-141	C-5	*KC-10	747	B-52
C-12	A-10	FB-111		*C-9	*T-43	C-22	*E-3	*B-1		DC10	*E-4	
C-21	F-4			DC9			C-135	B-757		L1011	VC-25	
*C-23	F-5			C-140			*KC-135			C-17		
T-37	*F-15						VC-137					
	F-16						DC-8					
	F-10X						EC-18					
	T-33						A-300					
	T-38						B-767					
	T-39											
	OV-10											
	C-20											

* CONTROLLING AIRCRAFT

GROSS WEIGHT LIMITS FOR AIRCRAFT GROUPS

	1	2	3	4	5	6	7	8	9	10	11	12	13
	PAVEMENT CAPACITY IN KIPS												
LOWEST POSSIBLE GROSS WEIGHT	5	7	49	69	22	61	92	60	150	325	240	334	180
HIGHEST POSSIBLE GROSS WEIGHT	25	81	114	175	121	125	210	400	477	840	590	850	488
	PAVEMENT CAPACITY IN KILOGRAMS X 1000												
LOWEST POSSIBLE GROSS WEIGHT	2	3	22	31	10	28	42	27	68	147	109	151	82
HIGHEST POSSIBLE GROSS WEIGHT	11	37	52	79	55	57	95	181	216	381	267	385	221

PASS INTENSITY LEVEL

LEVEL	1, 2, 3	4, 5, 6, 7, 8, 9, 10	11, 12, 13
I	300,000 PASSES	50,000 PASSES	15,000 PASSES
II	50,000 PASSES	15,000 PASSES	3,000 PASSES
III	15,000 PASSES	3,000 PASSES	500 PASSES
IV	3,000 PASSES	500 PASSES	100 PASSES
V	300,000 PASSES	50,000 PASSES	15,000 PASSES
VI	50,000 PASSES	15,000 PASSES	3,000 PASSES

NOTES

IN REFERENCE TO THE ALLOWABLE GROSS LOAD (AGL) TABLE :

- **A** Denotes lowest possible empty gross weight of any aircraft within the group exceeds the AGL of the pavement. Pavement cannot support aircraft for respective pass intensity level.
- **+** Denotes no weight restrictions. AGL of the pavement exceeds the greatest possible gross weight of any aircraft in the group

Pass intensity levels V and VI are used with reduced subgrade strengths to determine the maximum allowable loads during the frost-melt period.

UNITED STATES AIR FORCE
ENGINEERING & SERVICES CENTER
TYNDALL AIR FORCE BASE, FLORIDA

RELATED DATA

ENGINEER	DATE	DRAWING NUMBER
N/A	NOV 89	APPENDIX G
DRAWN PATRICK	SCALE N/A	SHEET 1 OF __

CLIMATOLOGICAL DATA

	J	F	M	A	M	J	J	A	S	O	N	D	ANN	YRS REC
TEMPERATURE (°F)														
HIGHEST	53	54	56	65	77	88	86	84	74	70	56	48	88	45
MEAN DAILY MAX	21	23	29	39	51	59	63	61	55	40	30	21	41	45
MEAN DAILY MIN	7	7	13	23	34	41	46	47	40	26	16	6	25	45
LOWEST	-46	-41	-42	-19	4	29	33	25	15	-12	-26	-38	-46	45
MEAN NO. OF DAYS														
MAX TEMP ≥ 90 °F	0	0	0	0	0	0	0	0	0	0	0	0	0	45
MIN TEMP ≤ 32 °F	28	25	28	24	10	1	0	*	5	19	25	29	194	45
PRECIPITATION														
MEAN (INCHES)	1.07	0.87	1.09	0.96	1.14	1.58	2.10	3.15	2.83	2.08	1.44	1.21	19.52	44
MEAN NO. OF DAYS > 0.5 IN	*	*	*	*	*	*	1	1	1	1	*	*	4	44
SNOWFALL														
MEAN (INCHES)	7.5	6.5	7.6	4.8	0.9	T	0	0	0.5	3.0	6.0	8.3	45.1	44
MEAN NO. OF DAYS > 6 IN	*	*	*	0	0	0	0	0	0	*	*	0	*	44
RELATIVE HUMIDITY (%)														
MEAN	76	76	76	75	73	74	79	81	80	81	80	77	77	45

MAXIMUM 24 HOUR PRECIPITATION

1.67 INCHES 44 YEARS OF RECORD

MAXIMUM 24 HOUR SNOWFALL

11.0 INCHES 44 YEARS OF RECORD

FLYING WEATHER - ANNUAL PERCENTAGES FOR VARIOUS CATEGORIES

A CEILING ≥ 1000 FEET AND VISIBILITY ≥ 3 MILES 90.6 %

B CEILING 500 900 FEET AND VISIBILITY ≥ 1 MILE, OR VISIBILITY ≥ 1 MILE BUT < 3 MILES AND CEILING ≥ 1000' - 5.3 %

C CEILING < 500 FEET AND/OR VISIBILITY < 1 MILE 4.1 %

D INSTRUMENT: CEILING ≥ 200 FEET AND VISIBILITY ≥ 1/2 MILE, AND EITHER CEILING < 1500 FEET OR VISIBILITY < 3 MILES 11.1 %

SOURCE OF DATA: RUSSWO 42-87 DATSAV 42-89

*= LESS THAN 0.5 DAY T=LESS THAN 0.05INCH

ANNUAL WIND COVERAGE TABULATION

RUNWAYS OR COMBINATIONS FOR CROSSWIND COMPONENT 10 KNOTS OR LESS

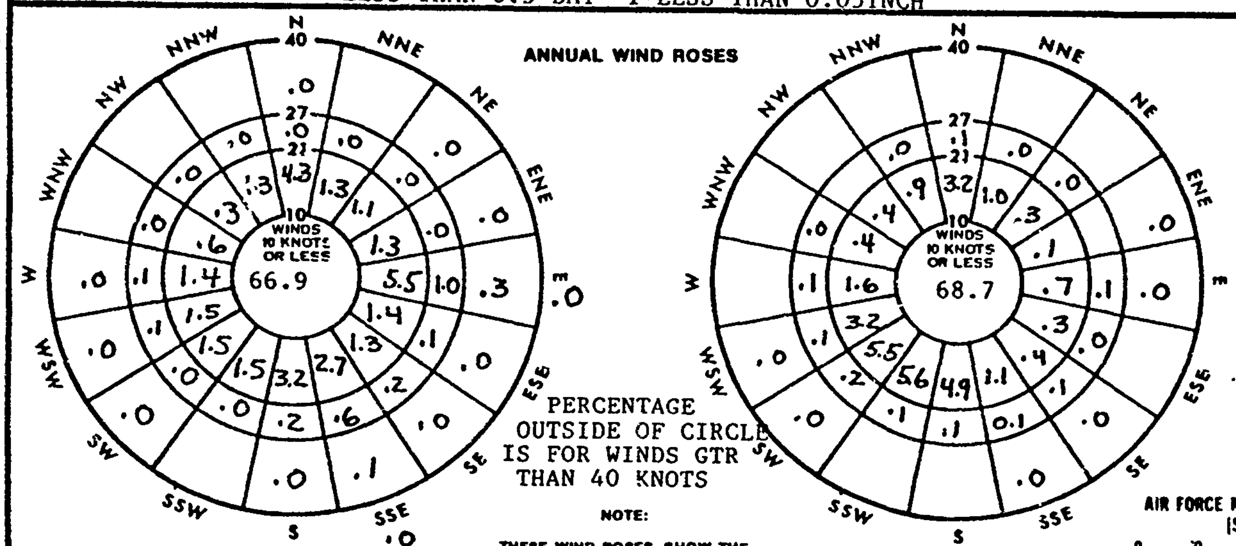
RUNWAY DIAGRAM	MAGNETIC MARK	TRUE BEARING	LENGTH IN FEET	(1)	(2)
	11-29		8500'	82.1	77.7

INSTRUMENT RUNWAY
(1) WIND COVERAGE (%) - ALL WEATHER
(2) WIND COVERAGE (%) - INSTRUMENT

ADDITIONAL DATA

FIELD ELEVATION 57 FEET MSL
MAGNETIC VARIATION 21°00E
SOURCE FLIP
YEAR 1991

ANNUAL WIND ROSES



ALL WEATHER

INSTRUMENT

PERCENTAGE OUTSIDE OF CIRCLE IS FOR WINDS GTR THAN 40 KNOTS

NOTE:

THESE WIND ROSES SHOW THE TOTAL % OF WINDS BY SPEED GROUP AND DIRECTION BASED ON TRUE BEARING.

ENGINEERING WEATHER DATA

AIR CONDITIONING DESIGN AND CRITERIA DATA (SEE AFM 88-8, CHAP 6)
WINTER HEATING DESIGN TEMPERATURE (SEE AFM 88-8, CHAP 6)
MEAN WINTER WIND SPEED 9 KNOTS
MEAN ANNUAL NUMBER OF HEATING DEGREE DAYS 11320 (SEE AFR 91-7)
PRESSURE ALTITUDE AND TEMPERATURE DATA FOR DETERMINING REQUIRED RUNWAY LENGTHS (SEE AFM 86-2)
EXTREME WIND DATA FOR CONSTRUCTION DESIGN (SEE AFM 88-3, CHAP 1)
SNOW LOAD DATA FOR ROOF CONSTRUCTION (SEE AFM 88-3, CHAP 1)
MAXIMUM FROST PENETRATION (SEE AFM 88-3, CHAP 1)
MEAN ANNUAL NUMBER OF COOLING DEGREE DAYS 002

NOTICE: WHEN NECESSARY, INTERPRETATIONS OF THESE DATA SHOULD BE SECURED THROUGH THE LOCAL STAFF WEATHER OFFICER

AIR FORCE RUNWAY WIND COMPUTER (SEE AFM 86-6)

KNOTS	0	10	21	27	40
MPH		12	24	31	46

KING SALMON AFB, AK
58°41N 156°39W
57 FEET
PREPARED BY USAFETAC
FEB 91

TAB D

FORM REVISED 1 DEC 77

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KING SALMON, ALASKA

TOPOGRAPHY

King Salmon is located in southwestern Alaska near the eastern edge of the Alaskan Peninsula where it blends into the Alaskan mainland. The salient feature of the local area is water. Naknek Lake is ten miles east and the Naknek River flows out from the western edge of the lake and passes one quarter mile south of the base on its way to its mouth at Kvichak Bay 15 miles west. In addition there are hundreds of small lakes, ponds, rivers, and creeks surrounding the base. The land area consists of rolling tundra spotted with many small hills averaging 200 to 400 feet in height. The Aleutian Mountain chain runs northeast to southwest 60 miles east though south with a spur of that range coming within 20 miles of the base to the east through southeast. The highest elevation within 30 miles of the base is 2900 feet 25 miles southeast.

VISIBILITY

Fog is the major visibility problem at King Salmon. Fog will occur on 134 days per year reaching a peak during July with 17 days. Due to its location far from population centers, smoke and haze are rare. They occur on just one day per year. Home heaters and automobiles can cause localized pollution problems. Blowing snow is more common, occurring on 12 days per year, 3 days per month from December through March. Blowing dust is almost unknown at the base but has been reported. Visibilities will drop below ten miles on 73 days per year and below five miles on 28 days per year. Visibilites below three miles are more uncommon, occuring on 18 days per year, visibilities below one mile will occur on eight days per year either in dense fog or heavy snow. Visibilities below one half mile will occur on four days a year, primarily with fog during the summer.

SEVERE WEATHER

Thunderstorms in the King Salmon area are not a problem, they occur on only one day per year, with the best chance during June. Severe weather in the area is primarily a winter phenomena. There will be 102 days each year with snow, with 13 to 15 days per month from November through April. Freezing rain will occur on nine days a year, usually during the late fall or early spring. The wind chills at King Salmon can be severe with wind chills reaching -65 Farenheit and a mean wind chill of -5 Farenheit from December through February. From December through March the winds associated with the Aleutian low south of the station can be very strong, usually above 40 knots. The winds are strong year around however, 50 knots having been recorded during every month of the year with an extreme wind of 82 knots. With the high moisture content and extremely cold temperatures during the winter there will be large frost accumulations on outside objects. Some sort of precipitation will fall at King Salmon on 239 days each year, peaking during August with 24 days. Warm permafrost may be encountered in the King Salmon area to a depth of about 50 feet. If permafrost is present, the range in summer thaw depth will be about three to six feet. If permafrost is absent, winter frost will penetrate to a maximum depth of from three to eleven feet depending on surface cover, exposure and soil conditions.